Rubber Journal and International Plastics

. 137 NO. 11 OCTOBER 24 1959 Price 1s. Weekly

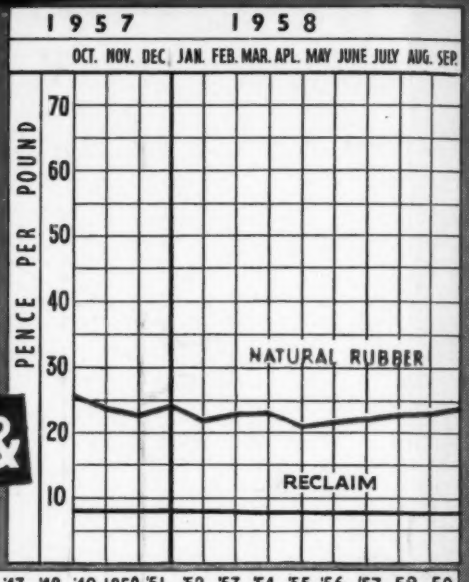
OF MICHIGAN
NOV
ENGINEERING LIBRARY

IT DOES WORK!

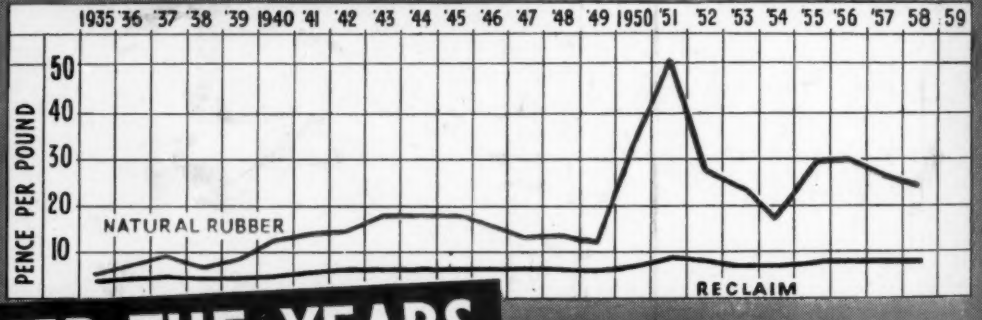
ANCHOR CHEMICAL COMPANY LTD - MANCHESTER 11

London Office: Grand Buildings, Trafalgar Square, W.C.2
Scottish Agents: J. & G. Hardie & Co. Ltd., 178 Fulton Street, Glasgow, W.3
American Liaison and Service Branch: British Anchor Chemical Corporation, 366 Madison Avenue, New York 17, N.Y

RECLAIM FOR PRICE STABILITY



OVER THE MONTHS &



OVER THE YEARS

RECLAIM serves the Rubber Industry as its best price stabiliser.
In addition to reducing costs it offers many other technical advantages.

Also suppliers of: DISPERSIONS, RUBBER LABELS, ACCELERATORS, ANTIOXIDANTS, PARACRIL RUBBERS, SYNTHETIC RUBBERS AND RESINS.

CONSULT... **THE RUBBER REGENERATING Co. LTD**

TRAFFORD PARK · MANCHESTER · 17

TELEPHONES: Trafford Park 1424/8 TELEGRAMS: "Regenerate" CODE: Western Union Telegraph, Universal-Edition

Editorial Director
JOHN D. COPEMAN

Editor
RICHARD ROWLAND

Consultant Editor
H. J. STERN
B.Sc., Ph.D., F.R.I.C., F.I.R.I.

Advertising Director
C. B. COPEMAN

Advertising Manager
A. S. KINGHAM

UK Area Representatives

M. J. Whelan, London

R. P. Finucane, Eastern Counties, Huntingdonshire, Hertfordshire, Bedfordshire, Buckinghamshire, Northamptonshire, Kent, Surrey and Sussex (Operating from London Office)

L. Quy, South and West of England and South Wales (Operating from London Office)

A. J. Legg, 55 Lee Lane West, Horsforth, Nr. Leeds. Tel. No. Horsforth 3845, North-East England, Lancashire, Yorkshire, Nottinghamshire, Lincolnshire and Derbyshire

W. Brown, 13 Allerton Road, Southport, Lancashire. Tel. No. Southport 5121, Scotland

E. A. Daniel, 'Brockenhurst,' 18 Thornhill Park, Streetly, Sutton Coldfield, Warwickshire. Tel. No. Streetly 1485, Midlands (excluding Staffordshire North of the A.5), Cheshire and North Wales

E. Burgess, 40 Parkside Drive, Maybank. Newcastle-under-Lyme. Phone 64678, Staffordshire North of the A.5

Foreign Representatives:

R. K. Larke, 7 Rue Pilaudo, Asnieres (Seine), France. Tel. No. Gresillons 42.24

G. Arnold Teesing, Rubensstraat 68, Amsterdam, Z (Netherlands). Tel. No. 727913

Albert Milhado & Co., G.m.b.H., Konigsallee 33, Dusseldorf, Germany, and Pompstraat 2, Antwerp, Belgium

Massimo Fano, Via V. Monti 14, Milan, Italy. Tel. No. Milan 808135

Rubber Journal and International Plastics

Volume 137 **Price 1s. Post free 1s. 4d.** **No. 11**

IN ITS 76th YEAR

October 24 1959

Editorial

NOTES OF THE WEEK 471

Articles and News

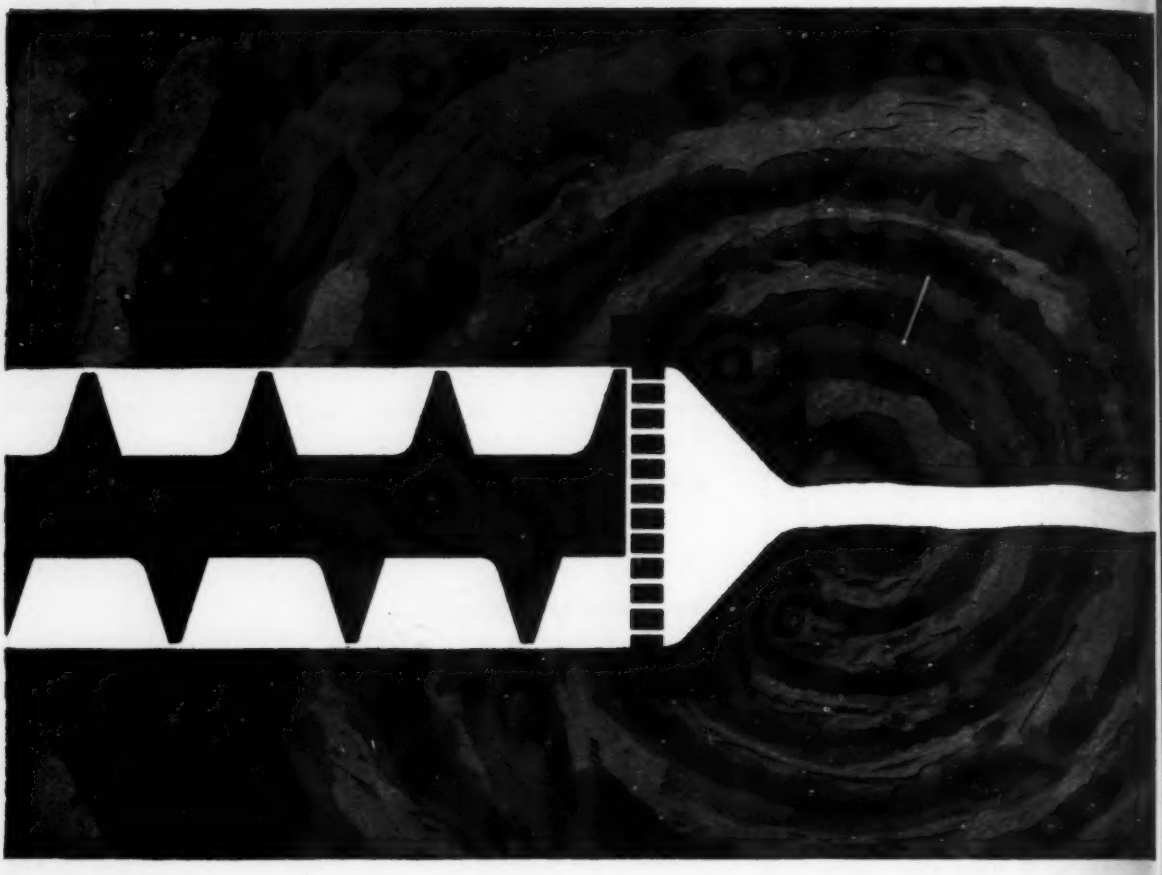
NEWS BRIEFS 472
PATTERN-MAKING IN PLASTICS—2 474
SALES OF PLASTICS MATERIALS 476
IRI AUTUMN CONFERENCE 478
PLASTICS AT DUSSELDORF 484
UK RUBBER STOCKPILE 491
RUBBER TECHNOLOGY—2 492
FASTER CURING BUTYL RUBBER 494

Features

VIEWS AND REVIEWS 486
QUESTIONS CORNER 488
MEN AND MATTERS 490
BOOK REVIEW 495
RUBBER STATISTICS 496
PATENT SPECIFICATIONS 496
RUBBER AND PLASTICS STOCK MARKETS 498
RUBBER MARKETS 500
INDUSTRY INTELLIGENCE 501
TRADE MARKS 502
COMPANIES IN THE NEWS 502

Classified Advertisements . . . 503 Advertisers Index . . . 506

MACLAREN HOUSE, 131 GREAT SUFFOLK STREET, LONDON, S.E.1
Grams: 'Buns, Souphone, London' Phone: HOP 5712
Annual Subscription, including Postage: United Kingdom and Oversea, £2 15s.; Index (half-yearly), 10s. per annum extra. Published weekly. Registered at GPO as a Newspaper. Registered for Transmission by Canadian Magazine Post. Entered as Second Class matter at Post Office, Boston, Mass, USA, under the Act of March 3, 1879 (Sec. 397 P. L and R.)



Bridge Extruders are an essential link in the chain of continuously expanding production. Designed for the processing of rubber stocks received directly from Bridge-Banbury Mixers, they eliminate the bottlenecks of numerous mill operations.

Being fully automatic, with drive to match the mixing cycle time of the Bridge-Banbury Mixer, they require no operators, occupy comparatively little floor space, improve manufacturing efficiency and reduce handling costs. Designed to maintain round-the-clock operation at completely stable thermal conditions and ensure optimum quality production at all speeds. Bridge Precision Extruders for all purposes are available in a complete range of sizes from one capable of extruding 20,000 lbs. per hour of uniform stock, down to small special-purpose extruders.

Bridge Automation is continuous production.

We invite you to discuss your technical problems or requirements with us . . . without the slightest obligation on your part.

BRIDGE

PRECISION EXTRUDERS

. . . ACCLAIMED AS THE ULTIMATE IN PRODUCTION EFFICIENCY

DAVID BRIDGE & CO. LTD. CASTLETON, ROCHDALE, LANCASHIRE

In technical association with Farrel-Birmingham Co. Inc. Ansonia, Conn., U.S.A.

'Phone Castleton, Rochdale, 57216 'Grams: Coupling. Phone Castleton Lancs.

London Office:
Broughton House, 6, 7, 8 Sackville St. Piccadilly, W.1. 'Phone Regent 7480. Grams & Cables: Ederaceo, Piccy, London.

NOTES of the WEEK

Planting Investment

A NEW edition of the *Manual of Rubber Planting Companies* is now available. This handbook normally comes out annually in January, but the publishers, Zorn and Leigh-Hunt, 3 and 4 Great Winchester Street, London, E.C.2, have decided to make a further issue this year because of recent important changes in the structure of many companies. Also, the rubber share market is at present attracting a broader following because of the generous yields now prevailing and the probability of larger profits with the next reports. The circulation of the up-to-date particulars in the publication at this time will be of help to investors interested in this section of the Stock Exchange. During the past year Malayan rubber shares, for the reasons mentioned above and also because of the sound statistical position of the industry, have shown appreciation. The upward movement also owes a great deal to the improving investment status of the stocks of efficient rubber producing companies. In a special circular issued last November, the publishers made the point that ' the share market is still affected to an unjustified extent by past prejudices stemming largely from the generally disappointing pre-war record of the industry as well as through limited dealing facilities existing in many stocks arising from the preponderance of smallish units.' Post-war developments have produced major changes in both directions. On the statistical side, the check to new planting arising from the war has limited output expansion (to which consumers were formerly accustomed) and, alongside this, world consumption has steadily increased. For the past four or five years, in fact, supply and demand have been in balance with a recent trend towards more stringency. The recent premium of more than 50% over the selling price of general-purpose synthetic could be a compelling inducement in favour of cheaper materials, irrespective of performance: there is reason to believe that natural rubber could hold its market against competition from man-made materials at around 28d. per lb. which, as it happens, is near the current average levels for 1960 deliveries and the likely average price for the whole of 1959. The marketability of shares, too, has been measurably improved by the build-up of larger units through amalgamations. The considerable acquisitions by Highlands and Lowlands, Seafield Amalgamated Rubber, Anglo Oriental Plantations and Kuala Lumpur are examples of this trend, which not only leads to administrative benefits to the groups concerned but also helps to create better marketing facilities. Because of this and the corollary that sizeable blocks of stock can be negotiated without unduly affecting market quotations, investment trusts and other financial institutions are showing greater willingness to include rubber holdings in their general investment portfolios.

Industrial Psychology

THE Department of Scientific and Industrial Research are to continue their annual grant to the National Institute of Industrial Psychology for a further five years. The amount is to be raised from £4,000 to £6,000 a year, on the understanding that the Institute will increase to £9,000 a year its own income from membership subscriptions and special contributions for long-term research. Up to now, the DSIR have provided £4,000 if the Institute raised a like sum from these sources. The DSIR are also to add another £100 a year for every £100 of grant-earning income which the Institute can obtain in excess of the qualifying £9,000, up to a maximum of another £6,000 a year. Previously, the maximum was £4,000 for income in excess of £4,000. This means that, if the Institute can raise £15,000 a year from industry, the Government will give it £12,000. The grant and the grant-earning income have to be put in a special fund and used only for long-term research. The DSIR grants began for a three-year trial period in October 1956. Last year the Institute received the maximum (under the old arrangements) of £8,000. Most of the grant-earning income comes from industrial firms who contribute as corporate members of the Institute. Among research projects now in train are an inquiry into workers' attitudes to the opportunities and rewards offered by their jobs, which may have a bearing on personnel policies; an investigation into the relation between satisfaction and efficiency on the job; a study of industrial management structure and efficiency; and experiments on tests for manual skills. The Institute has received many inquiries from industry recently about the special tests it has devised for selecting suitable school-leavers to be engineering apprentices. Meanwhile, the Institute is embarking on its usual series of autumn and winter courses for personnel officers and others in such subjects as interviewing, intelligence testing and vocational guidance. An interesting new departure this year is an introductory course on assessing and selecting people for jobs, to serve as background for those who later attend one of the more detailed courses. The interviewing course, as in earlier years, seems the most popular. The NIIP does a lot of useful work and the importance of its contribution, directly and indirectly, to the overall efficiency of industry, makes the award of this new grant well deserved.

NEWS *Briefs*

US CASEIN IMPORTS — WHEEL FACTORY FOR INDIA — CEYLON/CHINA EXCHANGE — POLISH TRADE AGREEMENT—NEW B.F. GOODRICH FILM

●**United States**—The Department of Commerce reports that US casein imports in July 1959 amounted to 7,975,554lb. This compares with 12,395,126lb. in June 1959 and 7,300,337lb. in July 1958. For the first seven months of 1959 US casein imports totalled 61,074,597lb. compared with 53,079,890lb. in the first seven months of 1958. The July 1959 total comprised: Canada 73,652lb., Argentina 4,213,906lb., Norway 75,368lb., Netherlands 373,510lb., West Germany 154,850lb., Poland 325,281lb., Azores 80,068lb., Portugal 100,949lb., Australia 493,870lb., New Zealand 2,016,047, and other countries 68,053lb.

●**India** — The Dunlop Rubber Co. Ltd. announces the establishment with T. V. Sundram Iyengar and Sons Ltd. of a rim and wheel factory in India. A new company is to be formed under the name Wheels India Ltd., the capital of which will be subscribed by the two companies, the Dunlop contribution being in the form of plant from the UK. Technical aid will be given by the Dunlop Rim and Wheel Co. Ltd. of Coventry. The factory will be situated near Madras and will have an initial capacity of over 200,000 truck wheels per annum. The Government of India has approved the project in principle and its agreement to the final details is expected shortly.

●**United States** — Development of a film claimed to be strong enough to be made into everything from flexible gas tanks for automobiles to rugged rainwear, has been announced in Akron by B. F. Goodrich Industrial Products Company. Mr. James C. Richards, vice-president of the company's industrial products division, described the film as a rubbery material derived from Estane VC, a development in polyurethanes by B. F. Goodrich Chemical Company.

●**United States**—The next meeting of the International Rubber Study Group will be held in Kuala Lumpur next September, it has been announced. About 150 experts from 22 countries are expected to attend. The conference is expected to discuss problems of increasing natural rubber production in the world, the position of natural relative to synthetic, new uses for natural rubber and marketing problems. The meeting, the 15th held by the Group, will be the first to be held in Malaya. The exact date has not yet been set.

●**Poland**—Poland will export synthetic rubber to Yugoslavia under a new 66 million dollar (each way) trade agreement for 1960 signed in Warsaw, the Polish news agency PAP has reported.

●**Ceylon**—A Ceylon Government trade group will leave Colombo for Peking shortly to discuss the prices and quantities of rubber and rice to be exchanged between China and Ceylon under next year's barter deal. In the current year, Ceylon contracted to sell 30,000 tons of rubber in exchange for 230,000 tons of rice.

●**India** — Satish Chandra, India's Union Deputy Minister for Commerce and Industry, called in Bombay recently for the establishment of a large number of new units in the plastics industry. These new units, he said, were required in addition to the expansion of existing units. He was inaugurating the 12th annual conference of the All-India Plastic Manufacturers' Association. He said that it was the Government's policy to encourage as wide a dispersal of chemical as well as processing units as possible, instead of allowing them to be concentrated in one or two areas. He also said that the Government was examining proposals, based on foreign collaboration, for the manufacture of plant and equipment in India for the production of plastics. They were also considering a proposal for setting up a modern tool room in the public sector at the Praga Machine Tool Factory at Hyderabad. The annual demand for moulds at the end of the third plan was expected to be substantial, requiring five or six tool rooms at least.

●**United States**—A new process for vulcanizing butyl synthetic rubber was reported in the US recently at the sub-section of the American Chemical Society by Dr Paul Viohl of the US Rubber Company. Dr Viohl said the new process found major application in the manufacture of butyl bags used in the curing of tyres. The new butyl bags lasted longer, permitted faster tyre-curing at higher temperatures and improved quality by giving more uniform control of the tyre curing process, Dr Viohl said. Other uses described for the butyl were in industrial rubber products such as conveyor belts which moved hot materials, steam hose, motor mountings, gaskets and seals.

'And this is one of my technologists'— Miss Bobo Forsdyke'—455

Nonox ZA

A POWERFUL ANTIOZONANT

Provides outstanding protection against ozone cracking, both in natural rubber and in synthetic rubbers (*especially SBR*). Possesses also marked antioxidant and anti-flexcracking properties.

Full technical information freely available on request

IMPERIAL CHEMICAL INDUSTRIES LIMITED · LONDON, S.W.1, ENGLAND.

D.887

Pattern-Making in Plastics

2. SOLID CASTING AND SHELL CASTING

(Continued from October 10 issue, page 326)

By H. G. KING

Summary

The introduction of plastics as a material for the manufacture of foundry patterns has opened a wide field for interesting development. For the past three years the possibilities of using this type of pattern in the iron, steel, and brass foundries have been investigated and developed in the Crewe Locomotive Works, by the author. After initial difficulties and trials with various types of resins and materials, the use of plastics has increased with such outstanding success, in both the pattern shop and the foundries, that pattern-making in plastics has been established and is now a recognized method of manufacture. As a result of the research into the use of this material, there are now over two thousand plastic patterns in use on moulding machines of various types, and these notes will illustrate the advantages that have been found to accrue from this comparatively new practice. The resins used in the manufacture of the patterns considered in this paper are the product of one particular firm; the formulas quoted are peculiar to these products and are not of a universal nature.

THREE main methods of plastic pattern manufacture have been developed and established. (a) Solid casting. (b) Shell casting with preformed core. (c) Fibreglass laminates.

Before deciding which of these methods to adopt, it will be necessary to consider firstly, the cost of material, particularly if solid casting is contemplated, and, secondly, labour costs which will be low for solid casting, but comparatively high if the laminated method is used, although this higher cost is offset to some extent by reduced material costs. The production requirements of the pattern will also have bearing upon this decision.

In general, however, solid casting is used only for the smallest of patterns such as elbows, unions, nuts, etc. It may be considered a sound rule that if a pattern is large enough to accommodate a core of some cheaper material, or cheaper plastic mix, it is usually economical, and advisable, to adopt the shell casting technique or produce the pattern by a process of laminating. We will deal, firstly with the solid casting method for which a standard casting mix is required and the formula for this is: Epoxy resin—100 parts; filler marble flour—75 parts; hardener modifier—65 parts. For the casting of these small patterns the medium speed hardener has been chosen.

To estimate the amount of material required the master pattern should be weighed, and, if made of pine, one and a quarter times its weight will represent the amount of Epoxy resin required. Assuming the pattern weight to be four ounces, and four such patterns are to be cast, 20oz. of Epoxy resin should be poured into a suitable tin, and to this added and thoroughly mixed, 15oz. of filler. Mixing may be by hand using a spatula in such a way as not to introduce any more air to the mix than can be avoided, and must be very thorough.

It may be considered worthwhile to allow the mix to stand at this stage for a time to permit some air to escape.

Thirteen ounces of hardener modifier are then added and mixing continued. The addition of hardener modifier will commence the process of gellation, and the period known as the pot life of the mix. This pot life is approximately one hour at normal room temperature, and this will give ample time to thoroughly mix the materials although pouring the mix should not be unnecessarily delayed once the hardener has been added. The mix should be poured in a constant stream avoiding the material overlapping upon itself and entrapping air.

An excellent way of feeding a mould is to pass the mix through a funnel which incorporates a fine mesh sieve. Its use has many advantages giving good directional feeding and constant flow. The sieve will tend to break up air bubbles incorporated during mixing, and prevent any unmixed filler and foreign matter entering the moulds. This operation is illustrated in Fig. 5.

The funnel is made of light gauge tinned copper and is formed to create a ledge upon which the sieve rests. The nozzle is made a separate part to facilitate cleaning.

The moulds now filled should remain undisturbed in room temperature until hard gellation has taken place, and this will take about three to four hours.

It is generally claimed that Epoxy resins can be cured at room temperature, and that post curing in the form of heat treatment is unnecessary, but during the period of slow cure the cast will be brittle. It is recommended, therefore, that the process of curing should be accelerated by giving heat treatment and six hours at 160° to 180°F. is sufficient to enable the work to be continued without further delay or fear of breakage. The cast should remain in the plaster moulds during this period, there is no danger of over cure at this temperature, and the period could extend overnight.

Coreboxes for these small patterns can be cast in the same way, but it is suggested that the filler should be replaced in the same proportion by slate powder. This will give a very hard surface to withstand the wear of trowelling, and that, I think,

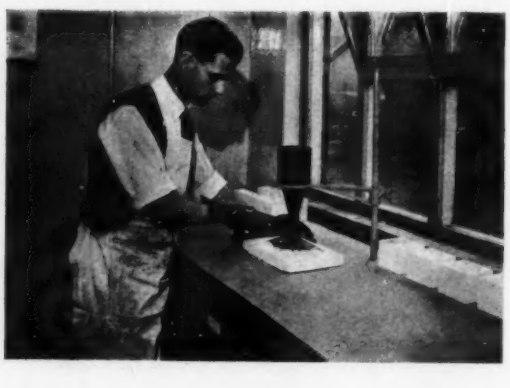


Fig. 5. Feeding the mix into the mould

covers in sufficient detail the production of very small patterns.

The type of pattern one would expect to find in considerable number on an average size machine plate, a process which is trouble free, without complications, but should, I feel, if for economic reasons only be confined to the smallest of patterns.

Shell Casting with Preformed Core

For a range of larger patterns the shell casting technique using a preformed core of some cheaper material or plastic mix has proved very satisfactory indeed for patterns such as valve bodies, etc. The introduction of this core will achieve considerable economy in material costs, keep the

Fig. 6. A core cut from solid cork will be placed in the top of the mould to reduce the thickness of the pattern

plastic to an even thickness thus ensuring uniform gellation, which in turn will control the amount of exotherm. The mixing of resin and hardening agent will cause a chemical reaction to take place which is exothermic, *i.e.*, it generates heat, and the greater the bulk of material so the degree of exotherm will increase.

It will be appreciated, that, without a core, a pattern of varying sections will gell in separate fields, the thicker sections very quickly, and the thinner ones taking the normal three or four hours.

An excess of heat can cause the surface of the cast to be distorted, and, in extreme cases can weaken the structure of the cast. It is possible to use a hardening agent which is slower in action thus creating a lesser degree of exotherm, which, at the same time prolongs the period of gellation. These slower hardeners are quite satisfactory and can be used with confidence up to a thickness of three or four inches. Resins and hardening agents, however, are expensive materials, and the economies which can be effected by the use of the core method are worthy of consideration. Two types of cores have been used with complete success. For patterns of simple design a core can be cut or built from solid cork allowing for a plastic shell thickness of a quarter of an inch. The core is brought to the top of the mould and carried in position by two strips of wood which are glued to the core and rest on the mould face. A core of this type is illustrated in Fig. 6.

The print, flange, neck and body of this cork are cut as separate pieces and glued and nailed together.

For more complicated patterns the core may be cast in a plastic material from a reduced mould made by lining the mould face with plasticine to a thickness of a quarter of an inch. There is no need for this lining to be elaborately finished. If the plasticine is rolled to a thickness of a $\frac{1}{4}$in., and cut into strips about $\frac{3}{4}$in. wide and so placed over the mould surface, this will be sufficient to create approximate form.

To ensure easy release of the core, and to preserve the plasticine for future use the face should be covered with a thin film of cellophane, and the mould is ready to receive the plastic mix, the formula for which is: Epoxy resin, 100 parts; hardener modifier (medium speed), 65 parts; vermiculite (grade 5) up to 100 parts.

This mix will produce about three times the volume of a normal casting mix for the same expenditure in materials, and, can be made in any quantity, and used in any thickness without fear of excessive exotherm.

The mix is made in the following way:—

The correct quantities of Epoxy resin and hardener modifier are first thoroughly mixed in a fairly large vessel and vermiculite added until stirring becomes difficult. From this stage mixing should be continued on a board using a small trowel in the way concrete is mixed, gradually adding the remainder of the vermiculite. The core is then formed by trowelling the mix into the mould using a little pressure to ensure good shape and

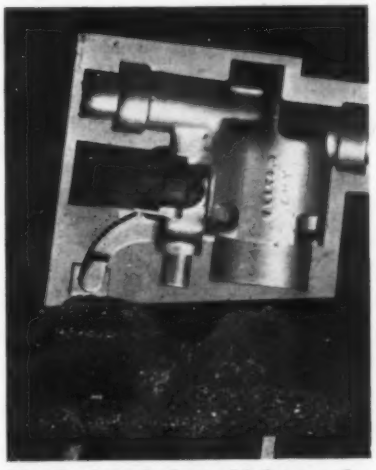


Fig. 7. A typical mould for a valve body together with a vermiculite core. too complicated to cut in cork

uniform density. When firmly set, and this will take about three hours at room temperature, the top face of the core should be sanded level with the face of the mould, the core then carefully withdrawn, and the cellophane and plasticine removed from the mould. Two wooden strips are now glued to the top face of the core to facilitate repositioning in the mould.

Figure 7 illustrates a typical mould for a valve body together with a vermiculite core, a core too complicated to cut from cork.

A standard casting mix is prepared, and a coating applied to the surface of the core which will be encased in the cast. The core is then repositioned and the shell filled in the normal way (Fig. 8).

Provision must be made for

Continued on page 484

Fig. 8. When the core is repositioned the shell is filled in the normal way

UK Rubber Stockpile

DISPOSALS BEGUN

ON September 15 the Board of Trade announced that discussions had been opened with the principal rubber-growing countries about the disposal of rubber from the Board of Trade stockpile. These discussions have now taken place, and disposals have begun. In devising the plan of disposal, particular attention has been given to avoiding any unnecessary disruption of the market, and to this end the plan incorporates certain features suggested by the Governments of producing countries in their discussions with the United Kingdom Government.

The plan provides that the maximum tonnage of rubber to be disposed of in any calendar month will follow a graduated scale according to the level of price realizable for the rubber. This scale begins at a price of 25¼d. per lb.; no rubber will be sold by the Board at prices below this 'cut-off' level. The scale of prices (pence per lb.) is as follows with corresponding maximum monthly rates of sale (tons) in parentheses: 25¼ and up to 27 (800), 27 and up to 28¾ (1,600), 28¾ and up to 30½ (2,400), 30½ and over (no quantitative limit).

The operative prices for the purpose of the scale are the prices actually paid by purchasers. The maximum tonnages to be sold below 30½d. per lb. in the period till the end of October will be half those laid down in the scale for a full calendar month. The Board will be prepared to sell in each month rubber for delivery during that month or the three following months. For example, in January it will be prepared to sell rubber for delivery either in January, or February, or March, or April, as desired by the purchaser; in determining the total tonnage to be sold in January in accordance with the scale, all rubber sold under contracts made in January will count towards that month's maximum tonnage, irrespective of when the rubber will be delivered.

The United Kingdom Government has agreed that it will not change the foregoing arrangements without first consulting once again with the principal producing countries; it recognizes that frequent changes would be undesirable, and it intends to adhere to the graduated scale set out above for at least a year. It has, however, reserved the right to change from a monthly scale of maximum tonnages to an equivalent quarterly scale (with certain limitations as to the way in which sales would be spread over the quarter) if experience in the first few months show this to be desirable.

Low-Carbon Ferrochrome

A new low-carbon ferrochrome that dissolves faster in a stainless steel bath than do other ferrochromes is now available from the Alloys and Metals Department, Union Carbide International Company, Division of Union Carbide Corporation. Called Simplex ferrochrome, the alloy is specially designed for low-carbon chromium additions to stainless steel.

French Plastics Industry

NEW CO-ORDINATING COMMITTEE

OWING to the considerable expansion that has taken place in the French plastics industry over the past few years, the several organizations of plastics manufacturers decided recently to co-ordinate their activities. It has now been announced that, following a meeting in July last, a new organization, 'Comité National Intersyndical de la Transformation des Matières Plastiques' has been formed.

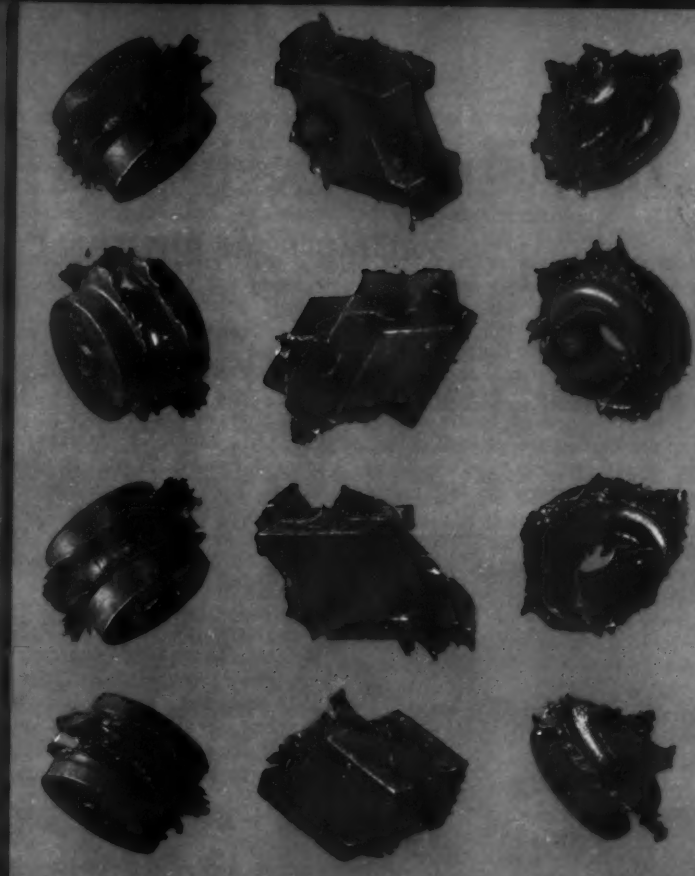
The committee is to undertake the study of questions of common interest and its functions will include also the co-ordination of activities and, when this is specifically requested, the representation of its members.

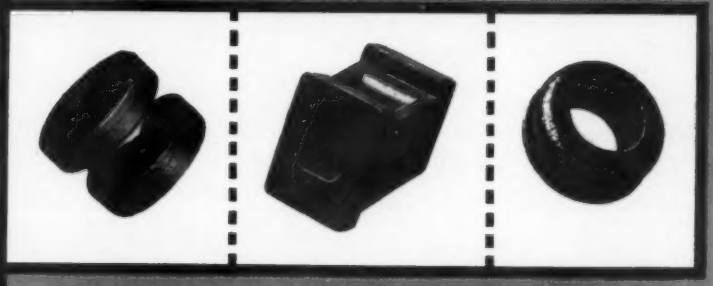
President of the new committee is to be M. Pennel, vice-president of the Syndicat National du Caoutchouc, des Plastiques et des Industries qui s'y Rattachent. Vice-president is to be M. Turgis, who is president of the Syndicate Général de l'Industrie des Plastiques Renforcés au Verre Textile. Hon. Secretary is M. A. Bartholoni who is general manager of the Union des Syndicats de la Transformation des Matières Plastiques. The address of the Committee is 3 rue Copernic, Paris 16e, France.

A conference of the Injection Moulders Committee of the British Plastics Federation will be held at the St. Ermin's Hotel, London, on Friday November 6.

Starting this month, Montecatini plans to have on stream at Terni, Italy, a 10 m. lb. per year plant which will produce polypropylene staple fibre, continuous multifilament and monofilament yarns. The company expects to triple its capacity to 30 m. lb. in 1960. Already in production, the cotton-like fabrics of pure polypropylene and polypropylene-viscose blends are bright and gaily coloured, machine washable, non-static, and have a high tensile strength and good resistance to abrasion. The floral print, *lower left*, and the period print, *above right*, are made of 65% polypropylene and 35% viscose, while the other floral design, *lower right*, is 100% polypropylene. The glen plaid is a polypropylene-wool blend, one of the many such wool-like fabrics developed by Montecatini

De-flash small rubber parts with 'DRIKOLD' in the Columbian International Sub-zero Tumbler





By freezing small rubber components with 'Drikold' —I.C.I. solid carbon dioxide—in a rotating drum, flashes become brittle and break off with the tumbling action.

Sub-zero deflashing with 'Drikold' can
cut your costs
speed your processes
increase your production.

I.C.I. Technical Service Staff will advise on your problems, and will de-flash sample batches of your components on request.

Sub-zero tumblers are obtainable from Columbian International (Great Britain) Ltd., 116 Cannon Street, London, E.C.4.

IMPERIAL CHEMICAL INDUSTRIES LTD.
LONDON SW1

Industrial Technical Organization

VALUABLE IRI AUTUMN CONFERENCE

THE Autumn Conference of the Institution of the Rubber Industry was held at Southport, Lancashire, on October 9 and 10. The first of its kind to be organized by the Institution, the conference proved to be a very great success and will undoubtedly encourage the IRI to hold further conferences on the same subject.

SIR JOHN N. DEAN

President of the conference, which attracted an attendance of more than 300, was Sir John Dean, president of the IRI. Chairman at all sessions was Sir Noel Hall, principal of the Administrative Staff College, Henley-on-Thames. Speakers during the two days were Mr R. M. Geddes, managing director, Dunlop Rubber Co. Ltd., Dr J. G. Mackay, chairman of Francis Shaw and Co. Ltd., Mr. C. T. Wilkins, a director and the chief designer of the De Havilland Aircraft Co. Ltd., and Dr W. D. Scott, assistant managing director of B.T.R. Industries Ltd.

After Sir John Dean had introduced the Mayor of Southport, Alderman William Berwick, who welcomed the conference to Southport, Sir Noel Hall took the chair and introduced the first speakers, Dr Mackay and Mr Wilkins. After the two papers had been read—theme for the first day was 'The Internal Organization and Administration of a Technical Department'—conference delegates divided into five groups for discussion sessions; chairmen for the groups being E. A. Murphy, Dunlop Rubber Co.; G. Martin, British Rubber Producers Research Association; G. Halstead, Veedip Ltd.; D. A. Bennett, International Synthetic Rubber Co., and A. H. H. Young, Liverpool Electric Cable Co. Ltd.

The theme for the second day, Saturday, was 'The Inter-Relation of Works, Technical Service and Sales Departments,' and after these papers the conference again divided into groups. When the conference was resumed after lunch, the group chairmen put forward points raised and questions asked by the different groups. These were answered by the speakers and there was then a short open discussion, after which Sir Noel Hall gave a summary of the conference. A summary of the papers appears below.

SIR NOEL HALL

Inter-relation of Works, Technical Service and Sales Departments

Dr J. G. Mackay, speaking on the 'Inter-relation of Works, Technical Service and Sales Departments,' said that there were a number of considerations to be taken into account—functions; finance; people; the chain of command; communications; design and development; quality control; and finally research.

On functions the speaker said the technical department to be considered should be one that was an integral part of a manufacturing organization, not a technical service department attached to a sales organization. The function of such a technical department was simply to design and develop products that could be sold at a profit. Technical men should at all times be mindful of the consequences of proposed changes in a product upon its manufactured cost. But to put the point in another way, the industrial chemist must recognize that the pound sign was a symbol that could never be deleted from his chemical equations. It was equally essential that those responsible for design and development should keep in touch with conditions of service, which for most products became steadily more severe.

DR J. G. MACKAY

Within the technical department there usually were sections dealing respectively with development, design, laboratory, product evaluation, process control, records and research. Dr Mackay went on to outline in some detail the functions of these sections.

Finance, said the speaker, was something that often caused great trouble to the technical man. A business would continue only if it made profits, and the magnitude of the technical effort it could justifiably support was directly related to profits. All departments, including the technical department, must recognize that expenditure must have a profitable objective. In smaller businesses the gains from technical effort must accrue quickly. Wise management would use operating ratios to determine what expenditure on individual items of overheads would lead to a balanced approach to profitable operations, and having determined these sums would use budgetary control to ensure operations to the required ratios. To this discipline of the accountant the

technical department must be answerable.

The next consideration he wished to discuss was that of people. Ultimately, the success of a company was determined by the quality of its people. The technical department above all must have people of the right quality. The qualified staff, in particular, must be chosen with great care. They are the leaven that leaveneth the whole. Besides, they were expensive these days. No longer were they 'cheap at the summer sales.'

The selection of qualified technical personnel for industry had now become a profession in its own right. He would not, therefore, attempt to define the ideal technical type for industrial work, but he stressed one quality, which was the essential above all others: the ability to work well with other people.

There was one lesson that must quickly be learned by the young graduate, if he was to make progress. He must respect the practical knowledge and skill of the experienced workman. They only appreciated how much they took this for granted when they transferred an industry to an area where the workers had no background in that trade. The new graduate must, therefore, learn that there was neither room nor justification for intellectual snobbery. Having determined his establishment, the type of man he would like, the technical manager started his search. At once he found that he was buying in a seller's market, having first confirmed that he was offering competitive salaries and conditions. He had to decide how he could attract into his team the men he would like in face of strong competition. The speaker believed that it was easier for the large companies to attract the good undergraduate. National advertising made their names household words, their large and world-wide organizations were obviously full of opportunities for well-qualified men. Nevertheless, he believed that in the smaller companies advancement could be at least as rapid for a young man who was determined to get to the top.

Dr Mackay spoke in some detail about other considerations relating to people.

On chain of command he said it was usually easier to engender enthusiasm for the task in hand so that the maintenance of discipline was less of a problem, but the chain of command must be clearly established and responsibilities precisely defined. A technical manager must keep to a minimum the number of individuals reporting directly to him and these must each have sole responsibility for a function: development, design, research, so forth. In technical work it was even more essential than elsewhere that the man in charge should regularly see for himself the work being done. Frequently his more experienced eye would observe a condition or a consequence of an experiment that had escaped the man doing the work. Moreover, a younger scientist appreciated a knowledgeable

Some of the delegates who attended the conference are pictured, *top*, during the proceedings. The other illustrations show delegates and their guests at the annual dinner

At the IRI Autumn Conference —

FRED MAY
AS SECRETARY OF THE Committee FRANK BALL -Dunlops- HAD
EVERYONE READY ON TIME FOR THE OPENING BY SIR JOHN DEAN President I.R.I.
& AMONG THOSE WE NOTICED WERE JACK BUIST I.C.I
J. G. MACKAY C.B.E. -Francis Shaw Ltd-
A.H.H. YOUNG Liverpool Electric Cables Ltd.
A.E. BUTLIN -Ferodo Ltd-
DR. W.D. SCOTT -B.T.R. Industries Ltd.-
C.T. WILKINS O.B.E. -de Havilland Aircraft Co Ltd-
H.C. GUTHRIE -Dunlops-
A.R.M. GEDDES O.B.E. -Dunlops-
F.D. CAMERON -B.B. Chemical Ltd-
F.C. JEAVINGS Committee
H.C. YOUNG
SIR NOEL HALL Chairman of the Conference
LOUIS LINDEBOOM -Rubberfabriek Bakker-
G. HALSTEAD -Veedip Ltd-
D.A. BENNETT International Synthetic Rubber Co Ltd

— with Fred May at Southport

interest in his work by a more senior person.

Two aspects of communications within a technical department were important. He regarded it as essential that each decision to undertake technical work on a problem should be followed by the issue from the office of the technical manager of the concise instructions on the assignment; its purpose and the methods of investigation to be followed. In this instruction it was particularly important that the question to which an answer is sought should be precisely defined. It was so easy to say 'let's do some work on the so-and-so,' and the speaker had found that was a most fruitful and substantial waste of money. Secondly, the technical manager should standardize the format of reports on technical assignments and should insist on clear, brief and simple English.

Considering design and development. Here again, it was not possible to deal fully and extensively with a tremendously broad field of endeavour. Progress, in design and development, required considerable facility for product evaluation. In the tyre industry this had led to substantial investment in testing machines which simulated in an accelerated manner individual features of operating conditions. On such machines, results had arbitrary if not absolute values, with the consequence that the machines became more valuable tools to the designer where a large background of testing had been built up. They were even more valuable when supported by years of road tests designed to correlate results from the test machines with performance in service.

Quality control was important. For a new product the designer established standards for materials and for the finished product. It then became the duty of those responsible for quality control to detect variations from those standards and to locate causes. In most technical departments this function was divided between laboratory, process control and inspection. But supervision of the function should rest solely with one individual, highly placed in the technical department and with his authority well established in the shops. In the speaker's view, that man should report to as high a level in the organization as was humanly practicable.

The last topic touched on was research. Dr Mackay had already indicated that for financial reasons only the large companies could engage in a substantial volume of research. But there were many extra-mural means whereby small companies could procure work on problems that are more than *ad hoc*.

In this country, they had industrial research associations engaged in programmes of work to do for their members, research work which they could not afford on their own. It was also possible to sponsor research work at research stations operated by semi-official bodies, such as the Agricultural Research Council. In the United States there were long-established private research organizations which would undertake sponsored work and at least two of these were now operating in Europe.

By these various means it was possible for the smaller manufacturer to secure access to specialized skill and equipment which it would not be economic to employ in one's own organization.

Internal Organization and Administration of a Technical Department

Mr C. T. Wilkins, who delivered a paper on the 'Internal Organization and Administration of a Technical Department,' said he found himself in a slightly invidious position, in that he was someone quite outside the rubber industry. He had spent his life in an industry which had grown up from very small beginnings, when people used to lie on their stomachs on the grass to see whether the aeroplane was lifting off the ground.

He thought that all technical departments must in essence be fairly well the same because they were all aiming to do the same thing. An analysis was given of the subject of the paper as it applied in the aircraft industry.

The aeroplane was a very complex piece of apparatus. A reasonable civil aeroplane today cost nearly some £1m., which in anybody's language was a lot of money. The point about the aeroplane really was that it was full of conflicting requirements and he knew that all engineering products were conflicting requirements, but the penalty of not striking the right balance between these conflicting requirements in the aeroplane was disaster. It was essential that the aeroplane should be constructed as lightly as possible.

The designer's job was to co-ordinate all these conflicting requirements, build up a team to carry out the work, design the aircraft, do all the test work and see that it was debugged and not delivered to the customer full of niggling little faults and troubles.

Discussing the position of the technical department within the broad

C. T. WILKINS

picture of the company's activities, Mr Wilkins said the first thing that happened when an aeroplane was being born was that a market research was carried out and was connected with the sales people. This market research was, of course, assisted by the technical department in a big way, but was not necessarily responsible to it. When it was decided which aeroplane was to be built, then the technical department came in full force on this with its research, aerodynamics, strength calculations, stress office, design, etc. Then when the aeroplane was built, the flight test, which was a responsibility of the technical department, was carried out.

Certain functions not directly under the technical department at all existed, such as service, after-sales service, production and in support personnel department, finance, costing, accounting, work study and methods, and it could be assumed that the technical department had a bearing sometimes directly, but in many, many cases indirectly also on almost all these various functions. For the poor chap for whom something were wrong, there were lots of people who could always very easily trace the thing right back to the chief designer. He was the one that was there to carry the can.

Mr Wilkins went on to explain the sequences involved in the manufacture of an aeroplane and outlined in detail the function of the technical department.

The Inter-relation of Works, Technical Service and Sales Departments

Speaking on the 'Inter-Relation of Works, Technical Service and Sales Departments,' Dr W. D. Scott said business was an enterprise created and managed by people but always limited by economic and social forces. The purpose of business was to create and satisfy a customer, so marketing and innovation could be regarded as the prime entrepreneur functions. So, as a result of its effectiveness in marketing, innovation and productivity, business enterprise in their capitalistic society should make a profit sufficient to cover the risks inevitably involved in its operations and thus to attract capital to it. As technicians and scientists, they will appreciate the value of a measuring stick to judge performance. For a business enterprise dependent for its operation and its development on capital resources and capital availability, the only measuring stick which could be considered was profitability on investment. Provided they recognized that, in making that profit, they had an accountability to their employees, their customers, their suppliers, their Government and the community, as well as to their shareholders, they should endeavour to ensure that their returns were as attractive as possible. It was often easy to debase quality in many products which our industry offers and, therefore, a great temptation existed to secure profit by sacrificing the principle of accountability to the customer.

Every manufacturing business has to be organized to produce, to sell and to develop and every cell of business activity within the organization needed to be profitable. The organization of the functions for the purpose of conducting a business would be influenced by the size of, the nature of, and the personnel abilities contained within the business.

Regardless of size, most companies in this country had regarded the strictly functional approach as unavoidable. Its great drawback was, in a business sense, the narrowness of outlook developed within its personnel. The individual often specialized for the whole of his business life as a salesman or as a factory worker, or as a technician. It became difficult for each to see the viewpoint of the other.

An alternative to strict functionalization was decentralized functions federated to enjoy the advantages of bigness. The business was divided as far as possible into self-supporting parts whether as separate companies, divisions or sections of business activity. This permitted concentration on product lines or markets, and, if pushed far enough down the line, encouraged and created a business outlook in those performing the basic functions, even in a comparatively junior capacity.

On the phasing of product and process development Dr Scott said that

DR W. D. SCOTT

the idea for a new product may arise from any point in a company organization. They all had bright ideas and all of them had been disappointed when their bright idea had been rejected because it was commercially, technically or economically unsound. Sometimes a tremendous amount of sales or technical effort had been uselessly concentrated on a product when a simple calculation at an early stage would have shown that its future was doubtful or that the capital required for the manufacture was beyond the resources of the company. The same problems could arise when the factory or technical staff conceived an idea for a major process or product change which may modify the quality, performance or use of the product. In short, they must recognize that any new product programme cost money. So, at all stages of product or process development, it was important that the commercial, technical and production personnel collaborate closely so that all aspects of the development could be kept under continuous examination having regard to time, expenses and capital requirements.

In the course of his paper the speaker also made detailed reference to the functions of technical service and other parts of industrial organization.

R. M. Geddes

Speaking on the same subject Mr R. M. Geddes said that Dr Scott's survey, broad and deep, had left them very near the outside edge of their subject. They should now try and take one further step outwards and then turn and look objectively at the departments. This approach, he thought, had two merits. First, it didn't really matter what size the departments really were, whether there was one man in them or a hundred. Referring to the word 'service' in the title of the paper, he said that industry existed to serve and the technical department had the right, and therefore duty, to initiate, to redirect at times, to the point of control, the policies, organization, staffing, equipment and activities of the other departments. In competitive business there were several fields, all essential to a perfect inter-relation between the departments and to their internal effectiveness where the point of view and, indeed, the final decision by an outsider, may be helpful. There were three kinds of subject, just as examples, where he thought this outside intervention might have some point. One concerned, as it were, the long-term strategy of a particular company, another changed the tactics, and the third was a rather more human point.

Taking first the longer term one, which was really three quite deceptively simple aspects of one question. How big and how quickly would it affect a new factory, a new product, a revolution in methods or materials? Second, were their priorities right? It was quite usual for exciting, new or radically improved products within the normal range of manufacture, to take rather too much attention away from improving the less glamorous 'bread and butter' lines on which this year's profit and healthy operation depended and which were, after all, going to pay for the cost of developing the new ones.

A particular course of action may be very good business for a company at one stage in its affairs and might attract too many resources or too sharp a competitive reaction at another time. One more reason for emphasizing what previous speakers had said, timing was all-important.

Mr Geddes then raised the question —how rigidly should the cobbler stick to his last? Growth and diversification were very fashionable nowadays and often very profitable too, but they posed questions, he thought, less suited to committees of equals, than to the decision of one man fully and well advised by the departments on the opportunities, of the risks involved, and checked, to be sure, by a board of directors, but nevertheless one man's sifting of the evidence, the addition of a good dose of instinct and hunch and finally, one man's choice.

Referring to the tactical question

the speaker said there were the stimulating but rather irritating short-term changes of conditions in which they worked which kept on prompting the question: 'It looked right yesterday, does it still look right today?' It may not be wholly fair to those engaged on the solving of the problems to expect them always to be alert to the changes in outside conditions; political, economic, competitive, scientific, which might suggest that after all they were working away on the wrong problem.

Turning to his last example, a more human and personal matter, Mr Geddes asked if all the departments were equally effective and generating an equal impulse or did

A. R. M. GEDDES

one sometimes dominate others more than the true merits of its argument could justify. This could turn on the nature of a problem, on an individual strength of personality or reputation or status, or merely on the more effective presentation of his case, or the more relentless repetition of it. Co-operation between the departments must not lead to a series of compromises but still less must one point of view carry more weight than it deserves. This was one aspect of the general and very important problem of maintaining vitality and the spirit of attack in all the sections of the business, even when much of their work may seem not particularly exciting. Clearly, there were implications in organization, staffing, training and so on in this.

The thread running through these three illustrations—the strategic one, the tactical one, and the human factor one, was, he thought, the theme of competitiveness, growth and change.

Dinner Speeches

Proposing the toast 'The Institution of the Rubber Industry,' at the annual dinner, the Mayor of Southport, Alderman William Berwick, said that the rubber industry was certainly something which was justifying its existence. It had done so many things that it would be impossible for him to refer to them all, but he did know that if it had not been for the Institution and its work and the rubber that was produced, this country would be a much poorer place. It had been a great asset in every direction during wars and in peace and he was hoping that it would continue for many, many years to come.

He felt that the British production of rubber was something of which this country must be very proud. He was certain that it linked the whole of the Commonwealth in its efforts to please not only those of this country and the Commonwealth but the whole world, and he sincerely hoped that they would continue to do so as long as it was possible to associate rubber with their Institution.

Sir John Dean

Replying to the Mayor of Southport, Sir John Dean thanked him for his delightful remarks made about the Institution, and also the rubber industry itself. Referring to the subject of the conference he said that at one time in his career he was technical manager of his company and he used to think that the budget which he was allowed by the financial people was dismal and poor—he never knew how he could get through. Eventually, he became chairman and realized the truth of his remarks. There was no doubt about it, a technical department could be extremely expensive, as Dr Mackay had mentioned, and he thought the organization of one that was run with a poor budget was extremely difficult, in fact, if it was small enough it became easy, because it became an organization of one man and that meant if he could organize himself he had got a good organization. But it was the intermediate size that was difficult when you got dual responsibilities. A man may be very good at his job, particularly, but he may be a damn bad writer and that meant that he was liable to keep his knowledge to himself and his work was wasted.

The Guests

Proposing the toast of 'Our Guests,' Mr J. M. Buist said if he was to say this was a Scottish Institution and like all good Scots they kept the Sabbath Day and everything else they could get their hands on, it would serve no purpose other than to assure that he had their attention. He stood before them that evening with mixed feelings, rather like the poor fellow who had just seen his mother-in-law drive off the edge of a cliff in his new car. No Scotsman, at the bottom of his heart, had ever much respect for rank, inherited wealth, except what he made for himself. When he went into the world he was not overburdened with a sense of other people's merits but, of course, he was very confident about his own. This, unfortunately, often made them forget according to the Scriptural promise that it was the meek that should inherit the earth. Because a man thought himself as good as his neighbour there was no reason why he should proclaim it at the top of his voice, and he was rather attracted to the advice—'loving your neighbour is to make him like yourself.'

In the hustle and bustle of everyday life it was rather difficult to provide a study of how to administer a business, and when time was divided on the occasion of a conference like this, it was very important that the speakers should be men of proved ability and he thought that they would all agree that their committee made a very happy choice when they chose Mr Geddes, Dr Mackay, Mr Wilkins and Dr Scott.

The speaker welcomed all the guests present and mentioned in particular the Mayor of Southport and the Mayoress, Mr C. T. Wilkins, and Sir Noel Hall.

Sir Noel Hall

Replying on behalf of the guests, Sir Noel Hall recalled an event which had taken place early in his career. The story, which, he said, illustrated the real reason for the conference, was heard with amusement. Sir Noel thanked the IRI for the conference and expressed his satisfaction with the way it had gone.

Witco Open Dutch Branch

The Witco Chemical Company Ltd., Bush House, Aldwych, London, European distributors of the carbon blacks manufactured by the Continental Carbon Company of America, announce that they have now opened a branch in Holland at West Blaak 5, Rotterdam. (Telephone Rotterdam 13.37.76.)

As is known, the Continental Carbon Company is at present building a plant in the Rotterdam area, where about 15,000 tons a year of reinforcing furnace carbon blacks will be manufactured and the Rotterdam office of the Witco Chemical Company Ltd. will serve as the sales office for the carbon black produced in Holland.

Plastics at Dusseldorf

THE Düsseldorf Plastics Exhibition, the third to be held in Düsseldorf and the largest of its kind in the world, was opened on October 17 by Dr Wilhelm Mauss, chairman of the Verband Kunststofferzeunde Industrie und Gebiete e.V. (Union of Plastics and Related Industries) and chairman of the Arbeitsgemeinschaft Deutsche Kunststoffindustrie (German Plastics Study Group).

Dr Mauss said that more than any other branch of industry, the plastics industry must necessarily establish a close contact between manufacturers, converters and the machine building industry. It was not sufficient to produce new plastic materials with improved qualities, but suitable machines and moulds must be designed in order to guarantee a best possible processing of the new raw materials. In this respect, the exhibition was a unique opportunity to exchange experiences with German and foreign manufacturers and thus to contribute to the technical progress in general.

Economic Developments

Turning to economic developments, Dr Mauss said that the plastics manufacturers of the German Federal Republic anticipated for 1959 an output of plastic materials of about 800,000 tons. This meant an increase in production of more than 100% since 1955, when the last Plastics Fair was held. The upward movement recorded for the plastic covering industry is as steep as that of the manufacturing industry. Even in 1958, sales were more than 100% higher than in 1955, and for 1959 they are expected to exceed by far the amount of D-marks 2,000m. Considering the respective export and import figures, an average consumption of more than 10kg. (22lb.) of plastic materials was calculated for the West German population in 1958.

On the question of European integration, he said the plastics industry was especially interested in a very close international co-operation. Of the highly industrialized European countries, all had efficient industries which were concerned with the manufacture of plastic materials. The same was the case with the processing and the machine building industries in these countries. All these industries are more or less dependent on a large market, as could be seen from the export statistics of the various countries.

European Plastics

As far as the German plastics industry was concerned, it not only welcomed the unification of six countries in the European Economic Community, but actively promoted it. The more so because it considered this union as a first step towards the production of a large European market which will offer better opportunities of development to all concerned. It was regretted that the efforts to organize a large Free Trade Zone had so far been unsuccessful, and it was sincerely hoped that the smaller Free Trade Zone, organized in the meantime, was a further step in the direction towards the desired aim—the formation of an inter-European market. The earlier the EEC countries fused with the smaller Free Trade Zone, the more advantageous would be, in their opinion, the prospects of the European plastics industry.

Dr Mauss outlined what such a fusion would mean economically to the German plastics industry. In 1958, approximately 28% of Western Germany's exports in plastic materials were sent to the countries of the EEC, while the countries of the smaller Free Trade Zone received about 36.5% of Western Germany's plastics export. This meant that these two economical unions were receiving about two-thirds of Western Germany's exports in plastics. If the two blocks, EEC and FTA were united, approximately 90% of Western Germany's output of plastic materials would be sold on this greater market. The export to countries outside this economic union would dwindle to about 10% of the production.

It was a proof of the 'all-European' attitude of the plastics industry that for many years an inter-European co-operation existed in various specialized fields and that it cultivated a friendly exchange of ideas. In addition, the Plastics Committee of the OEEC very effectively dealt with the synchronization of the various national statistics and was at present compiling statistics on the European plastics industry. This showed that, as far as industry was concerned, there was no lack of good will. It was to be hoped, said Dr Mauss, that the politicians would not throw obstacles in economy's way towards a European co-operation.

On the evening before the Exhibition opened, Mr J. V. Crossley, chairman of the publicity committee of the British Plastics Federation, spoke at a very well attended Press conference held on the combined British stand. Speaking in German, Mr Crossley welcomed members of the international Press to the British stand and went on to outline the work of the BPF.

With regard to the British plastics industry, Mr Crossley said that it was already certain that production in England for the current year would break all records, perhaps reaching 500,000 tons. British plastics products were meeting a large and increasing demand in the UK and a steadily expanding export trade all over the world. The UK exported large quantities to Germany and to other European countries and similarly bought large quantities. It was hoped that this international trade would continue to grow to the advantage of all and that the plastics industry would contribute increasingly to such developments.

Reviews of the Düsseldorf Exhibition will appear in later issues of *RJIP*.

Pattern-Making in Plastics

Continued from page 475

assembly of the patterns to machine plates, and, as neither vermiculite nor cork are suitable materials to drill and tap, ¼in. diameter holes, about 1in. deep, can be drilled at chosen points and filled with the casting mix, or, as an alternative, the core can be reduced at suitable points to increase the thickness of plastic to allow for drilling and tapping.

Of these two methods the one using the cork core is most attractive. This core can be roughly cut and costs very little to produce, the saving in material costs can be illustrated by this comparison. A 1lb. casting mix costs approximately 6s. and produces 20 cu. in. of material, and this can be replaced by cork the cost of which is 3d. for the equivalent volume. The use of the vermiculite core certainly produces a very solid and durable pattern, but material costs are not so greatly reduced, and labour costs are increased. It is, however, a technique too good to be ignored, and may well offer a method of manufacture well suited to a certain range of patterns.

In the course of an article in the last issue of *RJIP* it was stated that the European Free Trade Area included Finland. This, of course, is not so. Austria, one of the member countries of the FTA, was omitted from the list.

FURNACE

VULCAN 9 SAF
VULCAN 6 ISAF
VULCAN 3 HAF
VULCAN C CF
VULCAN SC SCF
VULCAN XXX SCF
VULCAN XC-72 ECF
STERLING SO FEF
STERLING S, PELLETEX } SRF
STERLING NS, PELLETEX NS } SRF-NS
STERLING L, STERLING LL } HMF
STERLING V GPF
STERLING 99 FF

CHANNEL

SPHERON 6 MPC
SPHERON 9 EPC
SPHERON C CC

CABOT

the world's only manufacturers of a complete range of Channel, Furnace & Thermal Carbon Blacks

THERMAL

STERLING FT free flowing FT
STERLING MT free flowing MT
STERLING MT-NS free flowing MT-NS

Plants throughout the South-Western United States, in Canada, England and France

Agents in principal cities of the world

London Sales Office

CABOT CARBON LIMITED 62 BROMPTON ROAD, LONDON, S.W.3

Tel. KNIghtsbridge 7181 (5 lines) Telegrams Cablak London Telex

Registered Office and Works: STANLOW, ELLESMERE PORT, CHESHIRE

VIEWS and REVIEWS

Wandering of Cross-Links

'WANDERING of Cross-Links in Rubber at High Temperatures' is the title of a paper by M. J. Voorn and J. J. Hermans (The University of Leyden, now the Cellulose Research Institute (State University of Syracuse, N.Y.) reprinted from *J. Polymer Science* (Vol. 35, pp. 113–118, February 1959) by *Rubber Chemistry and Technology* (Vol. xxxii, No. 3, July to September 1959).

There are strong reasons to believe that on heating a cross-linked rubber, cross-links are broken, and new ones formed. This has been established by Tobolsky and others. This having been noted, the authors then state that in the following they will discuss some experiments which give further support to these views, both of a qualitative and quantitative nature.

Synopsis

By cross-linking natural rubber in benzene, networks were prepared in which the degree of coiling was higher than normal ('supercoiled networks'). On heating these networks they were converted to normal ones with the same number of cross-links, but of a lower degree of equilibrium swelling. The results of the swelling experiments were in quantitative agreement with theoretical predictions. Results of stress-relaxtion experiments at elevated temperatures supported the conclusions based on the swelling experiments.

It follows the authors say, that great caution is needed when calculating changes in the density of the cross-links from changes in stress alone as is sometimes done in kinetic studies.

(The work had the financial support of the Goodrich Company who also supplied the rubber samples and the recipes for vulcanization in solution).

Vulcanization of Dry Rubber and Latex

'Vulcanization of Dry Rubber and Latex by Butyl Xanthogen Disulphide in the Absence of Free Sulphur' is the title of a paper by J. K. Dunn (BRPRA), reprinted from *Trans. IRI* (1958, 34. Dec.) and constituting publication No. 314 of the British Rubber Producers' Research Association.

Dry natural rubber and latex have been vulcanized at 100°C. in the absence of sulphur by butyl xanthogen disulphide, both with and without added zinc diethyl- or dibutyl-dithiocarbamate. The addition of dithiocarbamate yields a product with much better physical properties and ageing resistance than that with the disulphide alone. The physical properties of butyl xanthogen disulphide–dithiocabamate vulcanizate are comparable with those of a dithiocarbamate vulcanizate given the same cure time, and its resistance to ageing at 100°C., both in the Geer oven and, particularly, as measured by stress relaxation, is greater. However, the oven ageing resistance of the conventional dithiocarbamate-sulphur cure is superior at 70°C. The xanthogen disulphide-dithiocarbamate system is cited as an example of a general phenomenon whereby the combination of an organic polysulphide and a dithiocarbamate should yield sulphurless vulcanizates with good ageing properties and with a curing time dependent upon the stability of the polysulphide.

The Influence of Order of Addition of Rubber Compounding Ingredients

H. C. Jones (head of the rubber and plastics laboratory, research department, New Jersey Zinc Co.) has published in the September issue of the *Rubber World* (1959, 140, 857) an interesting paper on 'The Influence of Order of Addition of Rubber Compounding Ingredients at High Mixing Temperatures.' (1)

The author explains that there has been a gradual increase in the milling temperatures of rubber compounds in recent years so that currently a large percentage of all rubber stocks reach temperatures well above 300°F. in the normal mixing operations. This situation has been brought about by a number of factors, perhaps the most important of which has been economic. The necessity of processing greater amounts of stocks through limited mixing equipment has resulted in higher batch temperatures. These higher temperatures have been found advantageous for some types of compounds when a higher level of reinforcement is attained by a further cross-linking of the polymer resulting from the elevated temperatures. This has been notably the case with SBR and butyls.

What is the effect of the higher temperatures on zinc oxide, fatty acid, and accelerators? Further, should the carbon black be added early or late in the hot cycle? It does not follow that if the sulphur is withheld until the end of the mixing operation, or the sulphur is added on a cool mill, that the order of incorporation of the other curatives should be disregarded. These and other considerations led the author to examine the whole question. I cannot go into the history or the minutiae of the whole question, but I can at least attempt to give some of the more important results of his labours.

Summary and Conclusions

Early addition of zinc oxide and carbon black in the hot mixing cycle yielded the best physical properties, but under these conditions the tendency to scorching was greatest.

Zinc oxide has a stabilizing effect on the high-temperature mixings as indicated by the excellence of the stress-strain and the resilience properties of the compounds. These results were most pronounced with thiuram and sulphenamide accelerators.

The various sulphenamide accelerators exhibited variations in heat stability when mixed at elevated temperatures. The stability characteristics of these accelerators in factory processing, does not necessarily parallel, however, the evidence noted in these laboratory experiments.

[1]Presented before the Division of Rubber Chemistry, ACS, Los Angeles, May 15 1959.

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **DR SCHIDROWITZ**

Furnace blacks behave differently from channel blacks, and the point at which carbon black is introduced has a definite bearing on the properties of the compound.

These statements apply more specifically to NR compounds since this represents the more extensive part of the programme. The evidence from the more limited amount of work with cold SBR and butyl rubber, however, is that the same statements apply to these synthetic elastomers.

Cure Profile of Rubber Products

'A study of cure profiles of rubber products requires a method of determining relative state of cure.' Thus Dr Roger W. Strassburg opens his paper on 'Cure Profile of Rubber Products.' [1].

Dr Strassburg is the manager, General Chemical Laboratories of the B.F. Goodrich Co.

'The degree of cure in rubber can be related to the free sulphur content of the stock after vulcanization' is the way the editor of the *Rubber World* (1959, September, 140, p. 867) puts it, and he puts the question from a purely practical point of view. He goes on to say 'A problem in control work has been, however, to determine this free sulphur without destruction of the part.' 'This paper by Dr Strassburg which by using a rapid semi-micro modification of the sodium sulphite method, can make use of non-destructive sampling of tyres or other products, but still produce acceptable results.'

'The method is also ideally suited to the preparation of cure profiles of rubber parts. By dividing the part into marked small samples, a grid pattern of the free sulphur, or degree of cure, can be plotted. This plot may be used to pinpoint critical areas of the part with regard to cure. The method may then be utilized to provide control by coring very small samples from these predetermined areas.'

The problems in trying to grind or cut the samples without causing any change in the free sulphur are also described. The solution found in using 'dry ice' in a Wiley Mill, is shown to be acceptable and to produce results within statistical control limits.

(An appendix giving detailed instructions for the sample preparation and the analytical procedure is included).

Notes

A useful contribution on the progress made by Hypalon-Coated Nylon Fabrics has been made by Langley W. Isom (Product Manager, Vulcan Rubber Products, Reeves Brothers) in the *Rubber Age 1959* (September, 974). This material is of course a Du Pont proposition and 'foremost amongst Hypalon's properties is its resistance to abrasion and weathering.' It has according to Mr Isom, greater resistance to deterioration from high temperature than has any other elastic or plastic used for coating, and this is where Hypalon's use as a coating on fabrics is particularly of importance.

Samples of Coverlight–H Hypalon–Coated nylon were subjected to a Du Pont scrub test at an independent commercial testing laboratory. The number of operating cycles needed to wear away a coating is used as an index of the service durability of the coating. The samples submitted had survived 3,000 cycles on their face sides without wearing away the coating before the test was stopped as serving no further practical purpose. When tested on the reverse in the warp direction, the coatings were worn away after 1,800 cycles and in the filling direction after 2,400 cycles. According to the author of the paper in question this abrasion and flexing resistance exceeds by far that known for any other coating. For example in the same test nylon fabrics coated with vinyl chloride to the same weight as the Hypalon-coated material showed wearing away of the coating after 200 to 400 cycles. Other samples of Hypalon-coated material were exposed in Florida for more than two years without losing their colour or mechanical properties, and Hypalon's 'resistance to acids and alkalis is, of course, well known.'

Truck and Boat Covers

The truck (or lorry) industry has taken advantage of the Hypalon-coated nylon's advantages and Mr Isom gives several examples of benefits of the material including that of a subsidiary of the Burlington Railway. 'Hypalon officials have satisfied themselves that Hypalon-coated nylon lasts longer and requires less maintenance than any other fabric.' 'Many other trucking companies throughout the country have now also changed to Hypalon-coated nylon. . . . The initial cost of Hypalon-coated nylon is usually higher than that of conventional fabrics used as truck covers. However, the cost that really matters is the cost per year of operation. . . . However, judging by test results, this may well exceed five years.' I cannot here give examples of the various uses in connexion with boat work. Readers may rest assured that all the uses for Hypalon-coated nylon are having a good trial.

Omission

I much regret that I omitted to state in connexion with the paper by Messrs Docherty and H. Hughes in last week's 'Views and Reviews' that this was abbreviated from *Chemistry and Industry* of September 19, pp. 1171-1179, and that the authors belonged to the Billingham Division of Imperial Chemical Industries Ltd.

PHILIP SCHIDROWITZ

[1]Presented before the Division of Rubber Chemistry, ACS, Chicago, Ill., September 1959.

DUSSELDORF EXHIBITION

BRITISH plastic products ranging from cold water piping to aircraft fuel tanks are included in an official British group display organized by the Board of Trade in collaboration with the British Plastics Federation at the International Plastics Exhibition in Düsseldorf.

Ten British manufacturers are staging individual displays on the official stand, which covers 2,500 sq. ft. The overall theme of the exhibit is the importance of British plastics in industry today.

Exhibits include a 6in. diameter T-piece claimed to be the largest injection moulding of its kind in the world. There are also items of medical equipment and examples of the use of plastics in the motor, aircraft and electronics industries. Raw materials for the plastics, paint and allied industries are also featured.

Questions Corner—88

(Second Series)

371. When using urea formaldehyde resins for wet strengthening paper how may wet strength and broke paper be repulped?

372. Discuss some of the properties of nylon.

373. Give brief details of some of the plasticizers used in polyvinyl acetate emulsions.

374. What tests may be used when assessing polyvinyl emulsions?

(Answers next week)

Answers to Questions Corner—87

367. Determination of particle size and distribution may be determined by several methods:

Light transmission. — This method is based on absorptiometer measurements of the amount of white light absorbed by the emulsion particles. The light transmission is expressed as a percentage of the light transmission of distilled water. Latices are tested at a very low concentration of solids. Generally, the finer the particle size the greater the transmission.

Phase-contrast microscopy.—Unfortunately this method cannot be used when the particles are less than 0.25 microns. It is not applicable for determining distribution.

Sedimentation.—When a dilute suspension of particles is allowed to settle, the concentration at a given level varies with the time, depending on the particle size distribution. Distribution curves can be obtained by using a photo-extinction sedimentometer, but accurate determinations are restricted to particles greater than 1.0 micron.

Electron microscope.—Any method chosen has its limitations and more than one method may need to be used for determining a complete picture.

368. Polyvinyl alcohol is water soluble but has very good resistance to oils, greases, fats, hydrocarbons and chlorinated organic solvents.

Polyvinyl alcohol films are tough, non-toxic, odourless and highly impermeable to most gases. Sheet moulded from this polymer, unplasticized, has a tensile strength of up to 18,000 psi. Films can be obtained which are soluble in water, and also in a form that is insoluble in water. Such films have been used as protective strip coatings. They can be removed by merely soaking in water. Oriented films of non-hydrophilic polyvinyl alcohol are sometimes combined with films of cellulose acetate or cellulose acetate butyrate and are used in sun glasses.

Polyvinyl alcohol solutions are used as a warp size for textile yarns and, in addition to protecting the yarns such coatings reduce the resiliency, which is an advantage in weaving. The film is removed by immersion of the yarn in warm water.

Paper impregnated with polyvinyl alcohol shows increased wet strength which is a useful property for paper towels. It is also used for glassine paper where it acts as a softener. Its good resistance to oils and greases has been utilized in the manufacture of greaseproof paper and containers.

Polyvinyl alcohol is a good adhesive and can be used alone or in combination with other materials, *e.g.* starch, dextrin, etc.

The polymer is also used as an emulsifying agent and has, in this connexion, the property of functioning in a neutral or slightly acidic medium. It is also used as a thickening agent in shaving creams and cosmetics. It is widely used as a stabilizer in emulsion polymerization.

It can be compounded with fillers, plasticizers, pigments, etc., to produce moulding compounds for gaskets, washers and diaphragms.

369. Certain solvents are sometimes added to polyvinyl acetate emulsions to act as temporary plasticizers and assist film formation. They may also be added to facilitate the addition of a plasticizer which would otherwise be difficult to add to the emulsion.

Water immiscible solvents are emulsified when added to an emulsion, and if they are solvents for the resin they will be absorbed by the particles of the resin.

Water miscible solvents are dissolved in the aqueous phase of the emulsion and, if they are non-solvents for the resin they will tend to dehydrate the emulsion and cause instability.

When solvents are added to polyvinyl acetate emulsions there is an increase in viscoscity and this fact may be used as a method of thickening emulsions without the addition of conventional thickening agents which tend to reduce the water resistance of the film.

There is also an increase in tackiness and this can be an advantage in the preparation of an adhesive. In the same connexion a solvent will sometimes soften the surface of the material to which the adhesive is being applied and improve the adhesion.

Solvents that are used include ethyl acetate, toluene, xylene, cyclohexane, carbon tetrachloride, etc. Excess solvent must not be used otherwise the emulsion will become unstable. Care is required to avoid local solvent concentrations which may dissolve the polymer and cause instability.

370. Nylon is a thermoplastic material and compared with metals has more limited heat conductivity. It has a high melting point but the development of heat must be reduced to a minimum. This can be achieved by the use of a coolant, and water is often satisfactory, and strict attention to cutting speeds and feeds.

As drilling generates more heat than any other machining operation, this should be given special attention to ensure the best results. Nylon with a lower modulus of elasticity may give a tendency for the tool to rub, and consequently generating heat, if normal cutting angles and clearances are used, and some adjustment is necessary. Manufacturers of nylon products will give recommendations on this point. In order to obtain a satisfactory detaching of the swarf it is advisable to lift the drill out of the home from time to time.

In the case of small holes it is recommended that the drill point is ground off centre so that a hole of a slightly larger diameter than that of the drill is obtained. The feed should be reduced as the depth of the hole increases.

Satisfactory results have been obtained with a ¼in. drill at a speed of 2,000/3,000 revolutions per minute.

Band saws have proved more satisfactory than circular saws because the greater length of blade allows better heat dissipation.

Grinding is best done by using a soft wheel with a jet of coolant played on to the nylon. Wet sanding can be successful provided liberal quantities of coolant are used.

Wet sanding with a fine abrasive, followed by polishing with a soft mop using a high glaze paste, will produce a good finish.

(More questions next week)

For delayed action accelerators—

Monsanto

See Monsanto first!

Monsanto has the chemicals you need . . .

SANTOCURE · SANTOCURE NS · SANTOCURE MOR

In addition to the above products Monsanto's range of accelerators includes:

Aldehyde amines, thiazoles, guanidines, thiurams and dithiocarbamates.

Monsanto works constantly to develop new, better chemicals for rubber—as well as to improve those you already use.

Santocure is a Registered Trade Mark

Monsanto chemicals help industry – to bring a better future closer

Monsanto

Regd.

MONSANTO CHEMICALS LIMITED

579 Monsanto House, Victoria Street, London, S.W.1, and at [illegible]

In association with: Monsanto Chemical Company, St. Louis, U.S.A. Monsanto Canada Ltd., Montreal. Monsanto Chemicals (Australia) Ltd., Melbourne. Monsanto Chemicals of India Private Ltd., Bombay. Representatives in the world's principal cities.

MEN and MATTERS

A Review of People and Events

by George A. Greenwood

THERE will be a warm welcome from all quarters to Sir William Garrett, one of the outstanding figures in the industrial life of this country, who, a few days ago, was elected chairman of the Association of British Chemical Manufacturers. It is a two years' appointment and Sir William has already taken up the duties which go with the office.

To most readers of *RJIP* Sir William is best known as the personnel director of Monsanto Chemicals, but he is also, of course, famous as an administrator in industry generally, and incidentally, he has for some time been a life vice-president of the Association, into the chair of whose council he now steps.

Mr H. Wilson has been appointed Export Manager of the International Synthetic Rubber Co. Ltd., Hythe, Southampton. For a time he will be based at the Hythe plant but will eventually operate from London

He has already been much honoured. Sir William is an M.B.E., a Justice of the Peace, a B.Sc., a Doctor of Philosophy, an A.I.C., and he was knighted in last year's Birthday Honours List.

Some Yorkshire Changes

From the Yorkshire headquarters of British Belting and Asbestos at Cleckheaton comes the news that, as from the end of the year, Sir William Fenton, who has for many years been managing director, and for the past five and a half years has combined the duties of chairman with that post, will retire from the former post. Sir William will, however, remain chairman.

As managing director, he is to be succeeded by Mr Frank Pearson, who for the past 18 years has held the position of controller, and has been responsible for the accounting, secretarial and office side of the business. He is a son of the late Mr A. A. Pearson, who served the company for 64 years, and was its chairman from 1937 to his death in 1954. Mr Pearson was educated at Ampleforth and at Oxford University, and for many years served BBA at its London office before going to Yorkshire. He is an accomplished linguist, and has done a lot of travelling abroad for the company.

BIP Changes

Some important changes are announced by British Industrial Plastics. Mr C. S. Dingley has resigned from the board after 53 years' continuous service with the company. This veteran, now, I believe, in his early seventies, began his career in Birmingham, was for years later in London as sales director, and retired as an active executive in December 1956. He lives at Gerrards Cross.

Mr Harold W. Fender, managing director of Prodorite, who becomes a non-executive director of the company is, of course, well known as chairman of the British Chemical Plant Manufacturers' Association, and he knows all about the processes for the linings of containers.

Mr Paul Russell, director of research and development of the company's subsidiary, BIP Chemicals, who was chief buyer for it for some years, now becomes an executive director.

Electric Hose Retirement

Mr A. R. Moore, chairman and managing director of the Electric Hose and Rubber Co. Ltd., Uganda House, Trafalgar Square, London, W.C.2, and Almagam Mills, Harpenden, Herts., has retired after 60 years in the rubber industry.

Mr Moore commenced his apprenticeship at the new works of the Liverpool Rubber Co. Ltd., Zoo Grounds, Walton, in 1898, and three years later transferred to the company's Vauxhall Road Works, Liverpool. When these works were taken over by Charles Macintosh and Co., Mr Moore was appointed manager of the general mechanical goods department. The Macintosh business was taken over by the Dunlop Rubber Co Ltd., in 1926, and he was transferred to Cambridge Street, Manchester, as departmental manager of the mechanical department. After a period as departmental manager of Dunlop's Walton Works, Mr Moore left the organization in 1942 to become general manager of the Electric Hose and Rubber Co. Ltd. He was appointed a director of the company in April 1946, and became chairman and managing director in March 1949.

A. R. MOORE

An associate member of the Institution of the Rubber Industry since 1926, Mr Moore's certificate is No. 40, one of the earliest issued. He is a past chairman of both the Mechanical and Wrapped Hose Associations of the FBRAM.

A Notable Event

Up at Stoke-on-Trent one day last week there was an interesting and significant ceremony at the works of the Michelin Tyre Co. Ltd. It was to mark the retirement, after 47 years' service with the firm, of Mr Henri Barbarin, of Trentham, who began his career with the company in France in 1912, and was transferred to the London commercial staff eight years later, since when he has become what you would call an institution in the industry. Mr Barbarin had not long been in England when he was

appointed chief of the company's heavyweight tyres department. In that role he pioneered the use of Michelin 'Giant' tyres for large commercial vehicles, and became a master of this form of transport. During the Second World War he was Michelin's liaison agent with the Ministry of Supply, and since 1950 he has been head of central planning, storage and distribution of the Stoke factories' production.

For the occasion in the Potteries several of the company's London officials travelled to the Midlands and high tribute was paid to Mr Barbarin for his devotion to the company, and the excellence and the value of his work. Mr F. Garnier (general sales manager), said that in the early days he was responsible for the company's campaign to popularize the use on bus fleets of pneumatic tyres throughout the country.

Mr Barbarin was presented by his colleagues with a Georgian silver salver. Members of his own department had earlier presented him with a tea service.

Sales Tour

I hear that George Clarke, who is managing director of the Phoenix Rubber Co. Ltd., Slough, Bucks., and his wife are now on a 2,000-mile business trip in Germany. They are travelling in one of the many vintage cars owned by Mr Clarke, a Phantom 1 1928 Rolls Royce. He tells me that the bodywork and upholstery of this 31-year-old car are as good as new.

Mr Clarke is well known as an enthusiastic and successful trials driver. Last year he won the Knott Cup, awarded at one of the premier competition meetings held, of all things, on those terrible, tank-testing grounds down Dorset way. The Knott competition, incidentally, is one of the trials that count towards qualifying for the RAC Trials Championship. My picture shows George Clarke and his wife Elsa, who also takes part in a number of rallies, in their vintage Rolls.

Still Expanding

Up and up goes output of plastics, and every day shows increases in their new uses, at least so the Board of Trade tells us, for sales to both home and export markets in the second quarter of this year were well up at a total of 128,000 tons compared with 114,000 tons in the previous quarter and only 100,000 tons in the April-June period of last year.

This means, naturally, more factories and workshops to make plastics materials, but would you believe it, the latest one which is apparently to go up is almost under the shadow of the romantic spot which inspired that famous Northern ditty, 'On Ilkla Moor 'baht 'at.' It appears that the Ilkley Council has approved in principle an offer from a man unnamed to lease some of its land for what is described as 'light industrial development,' the applicant wishing, so the council authorities say, to put up a factory to make mouldings in plastic materials.

The unnamed industrialist has obviously confidence in his enterprise, for he is asking for a five-year lease on 8,000 square yards approximately, with an option to buy at £2,500 before the termination of this period. But as one who used to be taken to enjoy the rural delights of Ilkley, well, let me see, certainly 50 years ago, I must add that I never dreamed of one day seeing a plastics factory there!

Full marks go, by the way, to another great departmental stores in outer London—on Thames-side to be precise—which has organized a big exhibition, 'Plastics on Parade,' made up entirely of every conceivable kind of domestic utensil and articles of beauty.

George Clarke, Phoenix Rubber Co. Ltd., and Mrs Clarke are making a business tour of Germany in this vintage car

R. H. Windsor at Düsseldorf

I heard earlier this week that widespread interest was created on the first day of the Düsseldorf Plastics Exhibition by the machinery of R. H. Windsor Ltd. A particular attraction, apparently, was the AP200 injection moulding machine. This fine unit, which will mould articles up to 124oz. in polystyrene, is fitted with the Autoplas twin-screw, two stage pre-plasticizer. The other unit on the stand is the W15 fast cycling 4oz. capacity injection moulding machine.

Penalty of Success

I am told that Frank Ball, of the Dunlop Rubber Co. Ltd., Speke, has really laid up a lot of trouble for himself. His efforts as secretary of the organizing committee for the recent IRI conference at Southport were so successful that he is marked down, as George Martin, chairman of Council IRI, said at the time, for more organizing jobs for the Institution. From all accounts I gather that the organization at Southport was deserving of all the complimentary superlatives one can imagine. The whole occasion, which was very well attended, went off with that deceptive smoothness which disguises all the work that has been done. Mr Ball is secretary of the Merseyside Section of the Institution of the Rubber Industry. Other members of the organizing committee responsible for this notable conference were: J. M. Buist, B.Sc., F.Inst.P., F.I.R.I. (Imperial Chemical Industries), L. D. Gill, A.I.R.I. (Anchor Chemical Co. Ltd.), F. C. Jennings (Dunlop Rubber Company), G. Martin, B.Sc., F.I.R.I. (British Rubber Producers' Research Association), G. E. Nettleship, B.Sc., F.I.R.I. (Imperial Chemical Industries), S. D. Sutton, F.R.I.C., F.I.R.I. (Veedip Ltd.), N. Tatham, M.Sc., A.I.R.I. (J. E. Baxter and Co. Ltd.).

H. R. J. De Keyser, southern manager of Blue Peter Retreads Ltd., for the past 12 years, has been appointed the company's general sales manager for the UK, with effect from October 1959. J. A. B. Lloyd-Philipps has been appointed south-western sales manager and W. Marriott, south-eastern sales manager.

Rubber Technology

RUBBERS FOR SERVICE AT ELEVATED TEMPERATURES — PART 2

(Continued from May 23 issue, page 777)

By 'CROSSLINK'

CHOICE of plasticizer is of the greatest importance in the formulation of high temperature rubbers. Hydrocarbon oils and low molecular weight esters may be volatilized leading to premature stiffening of the rubber component, a process which is accelerated when conditions are such as to expose the surface of the rubber to a stream of dry air. General principles of formulation include the use of only the least volatile hydrocarbon fractions and a partial replacement of the esters used with polar rubbers by polymerized esters such as polypropylene adipate or sebacate or their modifications, the so-called 'polymeric plasticizers.' While these materials are weight for weight less efficient than monomeric esters, their low volatility at service temperatures up to about 150°C. ensures that the rate of loss of plasticizer is comparatively small.

For continuous service at 150°C. or above, or for intermittent service at higher temperatures, it is usual to employ virtually non-volatile materials wherever possible. Coumarone-indene resins are sometimes favoured together with synthetic resins discussed below. An interesting development is the use of silicone fluids of low volatility which may be so chosen that they covulcanize with the rubber, presumably through the presence of pendant vinyl groups in the siloxane chain structure. In this way, the plasticizer may be chosen so as to enhance the heat-resisting properties of the rubber in a similar manner to the incorporation of vinyl siloxane rubbers.

Antioxidants and Stabilizers

The protection of unsaturated rubbers against oxidation at elevated temperatures is often achieved by incorporation of organic amine derivatives such as phenyl-β-naphthylamine, ketone-amine condensates and similar materials. Since discoloration is seldom of importance in high temperature engineering applications, the principle compounding problem concerns the solubility of the antioxidant lest it should bloom. In addition, oxygen absorption studies have shown that the mechanism of antioxidant action is rather complex involving not only direct reaction with oxygen, chain transfer reaction in oxidative scission processes and termination of chains but also the initiation of chain processes. The relative dependence of each of these reactions on antioxidant concentration determines the behaviour during ageing and this has been demonstrated by oxygen absorption measurements on NR compounds containing increasing proportions of PBN. The rate of absorption decreased with increase of PBN concentration up to about 2 phr which corresponds to minimum rate of uptake. Further increase of PBN to 3 phr gave a similar absorption figure to that obtained with 1 phr which suggests that the chain initiation reaction may show greater dependence on concentration than do the various protective reactions. Most of the amines are moderately volatile and for continuous high temperature service, the polymerized amine derivatives are often preferable.

While of some value in neoprene and NBR, the efficacy of antioxidants in prolonging the high temperature service of butyl is in doubt since reversion is largely by a form of depolymerization rather than by oxidative scission. Again, Hypalon and the acrylic rubbers seem to benefit little from the addition of these materials. Chelating agents are useful in the unsaturated rubbers since they effectively immobilize the autoxidation catalysts such as copper and manganese.

There have been interesting and important developments in stabilizers for thermoplastics which have as yet had little impact on rubber compounding and it may well prove fruitful here to apply the experience of the one industry to the problems of the other.

Fillers

Fillers generally exert rather less influence on the high temperature serviceability of rubbers than do the other constituents of the mix. Nevertheless, marginal improvement in performance can be attained by special attention to the nature and quantity of these materials. Use of high proportions of zinc oxide in neoprene is a case in point. At very high temperatures, blacks tend to release gas and silicas are often preferred as reinforcing agents.

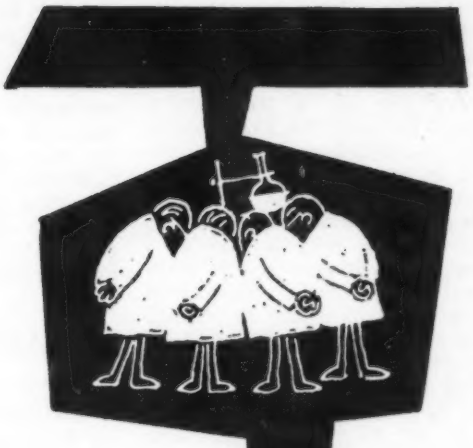
Chemical analysis for trace metals such as copper or manganese is essential when selecting a filler for unsaturated rubbers at elevated temperatures since autoxidation reactions may proceed very rapidly leading to unusually rapid deterioration of the rubber component. Organic fillers and extenders such as reclaimed rubbers should be used with great caution since although there may be little difference between the properties of the filled stock and a control when measured at room temperature, the difference in properties determined at the service temperature may yet be substantial. The considerable influence of temperature on the physical properties of even high performance rubbers is not always fully realized. For example, typical natural or SBR black compounds giving tensile strength figures in excess of 3,000lb. per sq. in. when measured at room temperature gave figures below 1,000 psi when the measurements were repeated at 125°C. and it is this low initial figure which is further deteriorating during service exposure. The moral of this is to take steps to give the highest possible initial strength to the rubber by proper choice and quantity of reinforcing agents.

Polymer Blends

One of the most important compounding techniques in raising performance with respect to temperature is by the blending of polymers. In some cases, blending of elastomers will produce 'additive' combinations of ageing properties in which some uniformity and constancy of property will result from contrary changes in each of the polymeric components. An example is the wide use of butyl-neoprene blends, in which the hardening of the neoprene is intended to offset the softening of the butyl during reversion. While satisfactory over short periods, after long periods of exposure at high temperatures the rubber shows obvious resolution into the two components, a granular material dispersed in a viscous liquid, the combination bearing little resemblance to a rubber. However, when co-vulcanization is possible, the combination of polymers may often exhibit satisfactory properties as is the case with mixtures of organic rubbers and vinyl silicones. In many cases, however, there is a tendency for the blend to exhibit some of the disadvan-

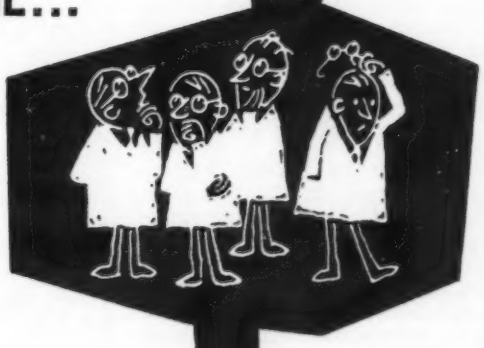
WORKS CHEMISTS...

If you are specifying an oil as an ingredient in your product, or as a processing aid or a carrier for less manageable materials...



THINK ABOUT A MINERAL OIL...

Shell will use all its resources of men, money and many refineries to give you exactly what you are looking for.



AND THINK ABOUT SHELL

You can be sure that Shell will have an oil of the right characteristics and with the right properties. A Process Oil to fit your plan.

SHELL PROCESS OILS

Telephone your local Shell-Mex and B.P. Ltd. Branch Office for further information.

SHELL *process oils*

tages of each polymer rather than for all its important properties to lie between those of the components.

Polymer blends are not restricted to rubbers. The use of thermosetting resins, in particular various substituted phenol/aldehyde condensates, has provided an excellent means of combining ease of processing with high vulcanizate performance. During processing, the resin behaves as a thermoplastic softener and in many cases it may replace conventional softeners which would be volatile under service conditions but which are nevertheless desirable during the initial mixing and shaping operations. On cure, the resin becomes cross-linked, usually by reaction with hexamine, and in doing so it usually becomes joined to the rubber net-work in such a way that a reinforced structure results. Particular examples are the use of cashew and other phenolics with NBR and NR and the use of dimethylol phenolics in the curing of butyl where the resin replaces sulphur as the vulcanizing agent with the advantage of forming a structure which is much more resistant to reversion and which is therefore much more stable under high temperature conditions. Such curing may bring disadvantages; use of high temperature cures and catalysts such as ferric chloride have shortened the cure times but the resin cured butyls are still at a disadvantage with respect to tear strength and certain other physical properties.

Developments of this type demonstrate the great need for polymer technologists as opposed to the older 'rubber technologist,' who was not supposed to know anything about plastics except perhaps for a rather superficial knowledge of the compounding and processing of PVC. Perhaps in the future, even a knowledge of rubber and plastics will not be enough and we shall have to cover surface coatings and textiles as well!

Processing Methods

The influence of processing methods on high temperature performance is usually quite small. The temperature of cure may have an important bearing but this is frequently determined by conditions other than service behaviour and so does not form an important parameter for the technologist to vary. The method of cure, whether in a mould, in open steam, in air, etc., would also be expected to influence subsequent performance but little published information exists which would form the basis of a reliable assessment. It is common practice to 'post-cure' certain organic rubbers (*e.g.* acrylic rubber, Hypalon) in air in order to reduce compression set and other important engineering properties to acceptable levels which remain fairly constant on initial exposure at service temperature and this is an accepted technique also in the processing of silicones and certain fluoro-rubbers. Mixing temperatures for rubber compounds may vary from about 50–60°C. (cold mill) up to about 170°C. or higher (hot internal mixer), promoters, peptizers and other additives may be employed and it is seldom if ever that proper consideration of the influence of these variables on service behaviour is given before production is commenced. It is well known that the perfect compound formulated and tested in the laboratory may behave very differently when it is produced in the works and the reason for this may not always be as simple as the lab. man likes to think!

(To be concluded)

Faster Curing Butyl Rubber

IRI LONDON SECTION MEETING

At the opening meeting of the IRI London Section's new session, held at the Café Royal, London, on October 6, Dr P. B. Lumb of the Polymer Corporation Ltd., Sarnia, Canada, addressed a capacity assembly on 'The Production and Properties of Faster Curing Butyl Rubber.'

Dr Lumb, who was introduced by Mr C. H. Avons, section chairman, said that butyl rubber was made by the copolymerization of isobutylene with a small amount of isoprene and the present range of polymers commercially available had unsaturation values of 0.8–2.2%. Materials with greater rates of cure were required and it was necessary either to increase the isoprene unsaturation, use some other diene, or obtain a more active group by a post polymerization modification.

If higher unsaturation was attempted by increasing the amount of isoprene, using the standard process of manufacture, a relatively low molecular weight polymer was obtained. Similar results occurred when other monomers were introduced which would copolymerize with isobutylene, and the polymerization system was also very sensitive to the presence of impurities.

Post polymerization modification such as chlorination or bromination necessitated additional expense, and the presence of a polar group in the resultant polymer led to poorer electrical properties.

Using very pure isoprene, polymers had been produced of 40-50 Mooney Viscosity and 70-80 Mooney Viscosity which had unsaturation values of 2.8 and 3.3%.

The properties of stocks and vulcanizates based on these new polymers using sulphur, quinoid, or resin curing systems were outlined.

As polymer unsaturation changed from 0.8→3.3% the modulus, Shore hardness and rebound resilience increased and the Mooney scorch time, tensile strength, elongation at break, compression set, ozone resistance, and swelling in ASTM Oil No. 3 decreased.

The introduction of more isoprene reduces crystallization and a 70-80 Mooney Viscosity polymer of higher unsaturation than Butyl 301 might be advantageous for low temperature service.

Heat treatment of conventional grades of butyl increased the modulus about 50% and the highly unsaturated polymers, after heat treatment, were comparable with styrene butadiene rubber in respect of torsional hysteresis at 150°C. and heat build up on flexing. Resilience was improved at tyre running temperatures.

The electrical properties and permeability to air were not dependent on unsaturation.

Hot air ageing of quinoid cured vulcanizates resulted in relatively little loss in modulus compared with the low unsaturation polymers and samples were shown which still had good elasticity after ageing. Under these conditions butyl softened, eventually forming a tarry material and the resistance to network degradation of sulphur, quinoid, and resin cured vulcanizates was being investigated. Chain, cross-link, or other types of scission occurred in varying proportions depending on the method of cure and slides were shown of the results to date.

Mr Avons commented on the excellent presentation and on the clarity of the slides, while Mr M. M. Heywood thanked Dr Lumb for a very interesting paper and emphasized the importance of fast rates of cure to the rubber goods manufacturer.

On conclusion of the business part of the evening members of the London Section IRI and representatives of many aspects of the industry were entertained once more, and right royally, at a party given by Polymer Corporation Ltd.

Sales of Plastics Materials

SECOND QUARTER

STATISTICS of plastics materials in the second quarter of this year show that not only have sales fully recovered from the slackness of last summer, but that once again they are expanding very strongly. Sales to both home and export markets have increased. Net sales of 128,000 tons in the second quarter of this year compare with 114,000 tons in the first, and 100,000 tons in the second quarter of last year.

The biggest expansion in sales once again occurred in thermoplastic materials, where sales of all types of materials were well above previous levels. However sales of polyvinyl chloride and of polythene in terms of volume accounted for the major share of the increase as compared with last year; since early 1958 there have been large increases in manufacturing capacity for polythene.

Sales of all types of thermosetting materials were higher than a year earlier. Although still small in terms of tonnage, sales of polyesters (other than for use in the manufacture of synthetic textile fibres) and epoxide resins continue to increase rapidly.

Exports in the second quarter were a record, at 37,000 tons. Comparing the first half of this year with a year earlier the increase in exports has clearly accounted for a very considerable proportion—over 40% in terms of volume—of the increase in net sales. Imports at 14,000 tons showed a sharp increase on the previous quarter (over 30% up) and on the average quarterly level of 1958.

The figures were compiled from returns from over 160 firms known to have been manufacturing plastics materials, whether for sale or for use in the production of plastics goods or incorporation in other goods (*e.g.* paint) containing plastics materials. Firms making cables who manufacture plastics materials from purchased resins are excluded. Synthetic materials for use as textiles are also excluded. The figures are free of duplication or double counting of plastics materials at different stages of production.

Northwestern Rubber Co. Changes

Following upon the change of ownership of the majority of the shares in The Northwestern Rubber Co. Ltd., Liverpool, it is announced that the Board has been reconstituted and Mr John Riddell, O.B.E., and Mr L. V. D. Tindale have been elected directors. The new Board state that they intend to continue, improve and extend the range of activities, and arrangements are already being made to implement this policy.

After an association of 52 years with the Company, Mr A. Nourry has retired as managing director but his services are being retained as consultant. He is succeeded by Mr Wilfrid Murray, Assoc.M.C.T., F.R.I.C., M.Inst.F., F.C.S.

Canadian Asbestos

Shipments of asbestos from Canadian mines in August rose to 91,929 from last year's corresponding total of 85,785, bringing January-August shipments to 658,924 tons, compared to 568,094 a year earlier.

Exports in August declined to 83,682 tons from 88,063 in same month last year, while cumulative exports increased to 634,035 tons from 529,822.

Rigidex high-density polythene manufactured by British Resin Products Ltd., is being used to make buoys and their rope attachments. The buoys are available from Dell Quay Yacht Yard Ltd., Chichester, Sussex

BOOK REVIEW

ANALYTICAL CHEMISTRY OF POLYMERS—PART I, ANALYSIS OF MONOMERS AND POLYMERIC MATERIALS: PLASTICS, RESINS, RUBBERS, FIBRES. (Interscience Publishers, New York, London. Price 125s.)

This is a further volume in the series on High Polymers. It forms Part I of volume XII. A second volume is promised which will deal broadly with molecular structure determination, chemical groups analysis, and identification procedures for polymers. The present work is under the editorship of Gordon M. Kline, National Bureau of Standards, Washington, D.C., and covers a wide field, as may be judged from the chapter headings which are as follows: I, Acrylic Plastics. II, Alkyds. III, Amino Resins. IV, Cellulose Derivatives. V, Epoxy Resins. VI, Ethylene and Fluoroethylene Polymers. VII, Furan Resins. VIII, Natural Resins. IX, Phenolic Resins. X, Polyamides. XI, Polyesters. XII, Proteins. XIII, Rubbers (Elastomers). XIV, Silicones. XV, Styrene Monomers and Polymers. XVI, Vinyl Polymers and Copolymers. XVII, Ion Exchange Resins. XVIII, Plasticizers. XIX, Synthetic and Natural Fibres. XX, Drying Oils.

There is no doubt that each author is a master of his particular subject but whether he can expound it to the general reader is another matter, and many of the descriptions of testing and analytical methods will not be at all clear even to the experienced reader. The book is essentially one for the specialist and each specialist will find in the chapter covering the subject in which he is interested, at least some information of value. Few readers, however, will wish to make use of more than one or two chapters in the book. It might have been better to omit a consideration of, for example, synthetic and natural fibres which merit at least a whole book to themselves.

Similarly the inclusion of plasticizers in a book on polymers is a little difficult to understand. They are admittedly polymeric plasticizers but curiously enough these do not appear to be dealt with in any way.

The most disappointing chapter of all is that on rubbers (elastomers). The whole field of the analysis of rubber both natural and synthetic is covered in a mere 17 pages. Under these conditions the author (Willard P. Tyler) has contented himself with writing what is, in effect, an introduction to the subject followed by a number of references. He does, however, give two or three detailed methods of analysis; why these have been selected is not clear.

∴ Copies may be ordered through the Books Department, RUBBER JOURNAL AND INTERNATIONAL PLASTICS, Maclaren House, 131 Great Suffolk Street, London, S.E.1.

Rubber Statistics

POSITION AT THE END OF JULY — UK — CEYLON

IT is now possible to amplify the preliminary details of the world rubber situation as at the end of July last which were recently published in these columns. In the table set out below, natural rubber production during the first seven months of the year is compared with production during the same period of 1958 (in 1,000 long tons).

NATURAL PRODUCTION

	Jan.-July 1959		Jan.-July 1958	
Malaya:				
Estates	226		214½	
Smallholdings	162½		151	
		388½		365½
Indonesia:				
Estates ..	124		137½	
Smallholdings	274½		163½	
		398½		301
Ceylon		43		55½
Thailand ..		90		84
Sarawak		22½		20½
Other British Borneo		12½		11
Liberia		23		21
India		10		12
Belgian Congo ..		21½		18
Others		145½		186½
		1,155		1,075

Malayan production, both on estates and smallholdings, has increased by some 11,000 tons, representing about 5% and 8% respectively. Estate production in Indonesia has declined by about 10%, but the vast increase in Indonesian smallholding production probably derives from revised methods of calculating the output figures. The decline in Ceylon's production, amounting to over 20%, is probably partly attributable to difficulties in moving the rubber, owing to disturbances in the ports.

The following table shows the natural rubber consumption position during these seven months:

NATURAL CONSUMPTION

	Jan.-July 1959	Jan.-July 1958
UK	103	105
USA	324½	261
France	80	84
Western Germany ..	80½	72
Remainder of Europe	298	277½
Others	339	310½
	1,225	1,110

The main increase in consumption during this period has occurred in the case of the USA, where it amounts to nearly 25% of last year's figure; in the case of synthetic rubber, the increase has been still greater, amounting to very nearly 30%. In the UK, natural consumption has fallen by 2,000 tons, while synthetic consumption has risen by 5,000 tons, in a combined total consumption of 147,000 tons.

Synthetic Rubber

Synthetic rubber consumption is illustrated in the following table:

SYNTHETIC CONSUMPTION

	Jan.-July 1959	Jan.-July 1958
UK	44	39
USA	611½	473½
France	35	34
Western Germany ..	36½	30
Remainder of Europe	39	36½
Others	94	74½
	860	687½

The overall increase in synthetic rubber consumption during the first seven months of the year amounts to some 25%, that in natural rubber consumption to around 10%.

Latest UK Position

Imports of natural rubber into the UK up to the end of July amounted to 95,389 tons of crude and 17,994 tons of latex. After allowing for re-exports of 16,943 tons, there remained for home consumption a total of 79,740 tons of crude and 16,700 tons of latex. During the comparable period of last year, re-exports had been very much greater, amounting to 96,959 tons, and had left a new supply of 81,969 tons of crude and 17,131 tons of latex.

This year's natural rubber consumption figures were 87,580 tons of crude and 15,793 tons of latex, as compared with last year's totals of 90,658 tons of crude and 14,460 tons of latex. Stocks on hand at the end of July had fallen, in the case of crude natural, from the year-end figure of 25,110 tons to 20,826 tons, while the latex stocks were almost unchanged at 4,717 tons.

Synthetic rubber imports went up from last year's figure of 38,974 tons to 45,748 tons, while the consumption total similarly increased from 37,808 tons to 43,969 tons. The increase took place mainly in the case of S-Type synthetic, consumption moving up from 28,385 tons to 34,595 tons. Stocks of synthetic on hand at the end of July stood at 10,348 tons, a reduction of rather more than 2,000 tons compared with the position at the beginning of the year.

Production of reclaim rubber during these months amounted to 24,381 tons, while consumption totalled 20,948 tons; last year's totals had been 23,734 tons and 19,642 tons respectively. Stocks of reclaim on hand at the end of July amounted to 2,583 tons, nearly 1,000 tons less than at the beginning of the year.

Ceylon

According to the Rubber Controller, rubber production in Ceylon during July amounted to 7,175 tons, bringing the total for the period January to July up to 43,008 tons. Exports of rubber during July amounted to 4,383 tons, bringing the total for the year to date to 53,687 tons. Countries taking Ceylon's rubber during July included the USA (1,238 tons), the UK (879 tons), Germany (716 tons), Canada (355 tons), France (347 tons), Italy (441 tons), Japan (190 tons) and Pakistan (57 tons).

Stocks held at the end of the month amounted to 33,942 tons, and included 26,351 tons with producers, 2,745 tons with dealers, 758 tons with manufacturers, 257 tons with the Government and 3,831 tons with shippers.

Patent Specifications

The following information is prepared from published Patent Specifications by permission of the Controller of H.M. Stationery Office. The full Specifications can be obtained from the Patent Office, 25 Southampton Buildings, W.C.2, at 3s. 6d. per copy (including postage).

Rubber Compositions

No. 813,141. Monsanto Chemical Co. Application and Filed, September 11 1956. Application in USA, September 12 1955. Published, May 13 1959.

Rubber resistant to ozone is produced by the use of a N-thiomine as a vulcanizing agent and the incorporation of a phenolic type of antioxidant in the rubber composition. Preferably, a mercaptoarylthiazole type of accelerator is employed. When discolouration of the rubber composition in sunlight is immaterial, suitable N-thioamines are bis (primary alkylamine) disulphides, but when a non-discolouring composition is required, N—thioamines of the bis (cycloaliphatic amine) disulphide type are used. Phenolic antioxidants which are acceptable for use with the N-thioamines are the alkyl hydroquinones. The compositions used in the example were based on pale crepe and contained bis-morpholine N,N^1-disulphide as the vulcanizing agent and 2,5-di-tert-amyl hydroquinone as the antioxidant.

Carbon Black

No. 813,162. Columbian Carbon Co. Application and Filed, April 1 1957. Application in USA, May 24 1956. Published, May 13 1959.

Reduction in structure of high-structure carbon black to be used in rubber is effected in a continuous manner by passing the carbon black as a continuous, uniform stream between two rolls with hard surfaces set to a clearance not exceeding 0.030 in. and rotating at different peripheral speeds. The black is predensed to a bulk density of at least 15 lb./cu. ft. prior to its passage between the rolls. Examples relate to the conversion of (a) a high-structure HAF black to a VFF black, (b) a high-structure ISAF black to a channel-type black, and (c) a high-structure FEF black to an FF black. Results are included of tests in rubber of these three blacks before and after treatment.

BELT-CONVEYING COSTS CUT BY HALF AT I.C.I. PLANT

Butyl Rubber covered belt has already lasted 3 times as long as any other—and still no sign of wear

By installing Butyl Rubber covered conveyor belting at their Billingham Chemicals Plant, I.C.I. have cut the cost of belt-conveying phosphate fertilizer by half, and the belting still shows no sign of wear.

WORKING LIFE TREBLED

Owing to the heat of the fertilizer at this stage in the process (*about 115 degrees centigrade*), and the usual damage due to moisture and ageing, even the best synthetic rubber belts used previously have worn out in a year, after shifting about 132,000 tons. A second Butyl Rubber belt was installed elsewhere in the plant three years ago and has shifted 500,000 tons.

COST STILL GOING DOWN

The Butyl Rubber belting is still in perfect condition. And, although it is impossible to forecast its future life, it is expected to reduce the cost of belt-conveying still further.

When ordering conveyor belting it will pay you to specify

Esso Butyl

The man-made rubber with the longest flex life and the greatest resistance to heat, corrosion, ageing, ozone, moisture and tearing. (For handling specially hot materials, Esso Butyl covered belting is even more efficient on a Terylene base.)

Esso Butyl is identical to 'Enjay' Butyl which has established a high reputation in the United States

For information about Esso Butyl Rubber
Telephone: HYD 7030, or write to
Esso Petroleum Co, Ltd, Chemicals Dept,
50 Stratton St, Piccadilly, London, W1

Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

THE boom in share prices touched off by the result of the General Election has been—to all intents and purposes—all embracing in its scope. Nearly every equity with an industrial affiliation has found support or has been carried upwards by the sheer impact of the buying spree.

There is little rhyme or reason to the buying which at times has approached a volume which can only be called indiscriminate. Of course, the shares of the rubber manufacturing and plastics companies have benefited from the boom. The latter more so than the former because they have been helped along by the industry's excellent production figures and the very buoyant comments these figures brought forth from the more sober observers.

Another sustaining factor has obviously been the wonderful showing made by the half-yearly figures from the IMPERIAL CHEMICAL INDUSTRIES giant. While it is true that these results were out before the election, the real promise held out by the figures was not fully reflected in the shares until the Conservative victory was assured. I.C.I. ordinary had been rated as something of a 'political' risk and once that element of doubt was removed the shares were left to find their real level. It is difficult, exceedingly difficult, to make out an investment case for the ordinary shares of I.C.I. at their present level. This, of course, is equally true of other shares in the chemical section which are also backed by promising results.

It would seem that the market is now due for some form of technical correction, and this cannot be long delayed.

It would be a major mathematical exercise to calculate the value of the rise in the list of shares above. In half dozen of the leaders alone, it would have to be measured in millions.

Imperial Chemical ordinary shares have reached a peak of 56s., which represents a rise of more than 10s. on our previous quotation. The ordinary shares of the Courtaulds giant have shot ahead by nearly the same amount spurred on by hopes of a cheering half-yearly statement. One of the most impressive gains was in I.C.I. convertible loan stock which has now reached a level of some £173, up by around £30. The price of this stock, because of its conversion rights, is geared to the level of the ordinary shares.

The election result was sufficient to make investors forget their recent disappointment with the profits of the LEYLAND AND BIRMINGHAM RUBBER group. Its shares spurted by 4s. 6d. to 52s. 6d.

LAPORTE INDUSTRIES whose ordinary shares were up to 26s., is lifting its interim from 2½ to 3%. In the previous year the final payment was 5½% and it would appear that there is a very good chance of this payment also being adjusted upwards. The

Continued on page 500

Share Price Movements

Par Value	Company	1958-59 High	Low	Oct. 3	Latest
5/-	Albright & W. Ord. ..	27/-	13/4½	23/9‡	26/6
£1	„ „ „ 5% Pref...	16/7½	15/4½	16/3	16/4½
5/-	Anchor Chemical Ord...	15/9	10/3	15/6	15/6
5/-	Andersons Rub. Ord. ..	4/3¾	3/-	3/2¼	3/1½
2/-	Anglo-Amer. Vulc. Fibre Ord.	4/3	2/-	3/9	3/9
£1	Angus Geo. Ord. ..	34/3	21/-	28/-	33/6*
5/-	Ault & Wiborg Ord. ..	23/-	11/9	21/6	22/6
£1	Avon India Rubber Ord.	43/3	27/-	38/6	43/-
£1	„ „ „ 6% Pref.	18/6	17/3	17/6	17/6
10/-	Bakelite Ord.	34/6	17/-	29/10½	33/9
£1	„ 6% Pref. ..	19/6	18/3	18/1½	18/1½
£1	Baker Perkins Ord. ..	47/9	30/7½	45/9	45/-
4/-	Bank Bdg. Rubber Ord.	3/1½	1/6	2/7½	3/1½
5/-	Boake (A.) Roberts Ord.	18/6	9/-	18/-	18/6
£1	„ „ „ 5% Pref.	15/1½	13/9	13/9	15/-
4/-	Brammer H. Ord. ..	14/9	9/6	13/7½	13/6
5/-	Bridge, David Ord. ..	32/6	16/3	31/6	32/-
5/-	Bright, John Ord. ..	15/9	8/9	14/3	15/6
2/-	Brit. Ind. Plas. Ord. ..	8/6	4/9	8/-	8/3
2/-	„ 10% (tax free) Pref.	5/9	4/7½	4/7½	4/3
£1	British Xylonite Ord. ..	64/-	28/6	59/-	62/6
£1	„ „ 5% Pref.	15/9	14/-	15/9	15/7½
5/-	BTR Ind. Ord.	13/3	8/1½	8/4½	9/-
£1	„ „ 7½% Pref. ..	22/9	20/9	22/9	22/6
£1	Courtaulds Ord... ..	51/-	20/-	40/1½	49/9
£1	„ 5% 1st Pref.	18/6¾	15/7½	17/3	17/-
£1	„ 6% 2nd Pref.	20/3	17/1½	21/1½	20/-
4/-	Cow, P. B. Ord. ..	7/3	3/6	7/-	6/6*
£1	„ 5% Pref. ..	14/3	10/9	14/-	14/-
5/-	Dale, John Ord... ..	24/6	10/-	16/9	23/3
£1	„ „ 6% Pref. ..	16/-	13/-	16/-	15/7½
1/-	Dannimac Mfg. Ord. ..	8/9	2/6	7/6	7/9
10/-	De La Rue Ord. ..	56/-	42/9	47/-	55/6
£1	„ „ „ 3½% Pref. ..	11/9	10/-	10/6	11/9
6/8	Distillers Co. Ord. ..	32/-	15/9	28/1½	31/3
£1	„ „ 6% Pref...	21/7½	19/10½	21/-	21/-
£100	„ 5% Conv. Loan	£96½	£91	£94	£93
£100	„ 5½% Unsec. Loan	£95	£87 7/8	£92½*	£92
10/-	Dunlop Rubber Ord. ..	28/-	14/9	24/9	28/-
£1	„ 5½% Pref.	19/-	15/10	18/1½	18/9
£100	„ 3½%1st Debs.	£77½	£67¾	£74¾	£77½
£100	„ 4½% 2nd Debs.	£84	£78	£83¾	£82½
4/-	Ebonite Cont. Ord. ..	15/3	7/6	11/1½	11/6
£1	English China Clays Ord.	66/-	29/9	65/-	71/-
£1	Goodyear Tyre 4% Pref.	12/9	12/-	12/1½	12/9

Par Value	Company	1958-59 High	Low	Oct. 3	Latest
5/-	Greeff Chem. Ord. ..	28/9	14/-	26/9	28/9
10/-	„ „ 5½% Pref. ..	8/3¾	7/9	8/3	8/-
4/-	Greengate & Irwell Ord.	7/0¾	4/1½	4/7½	4/3
£1	Harrisons & Crosfield Dd.	71/-	43/9	65/7½	70/-
1/-	Hunt & Moscrop Ord. ..	2/1½	1/1½	1/6¾	2/1½
£1	Imp. Chem. Ord. ..	56/-	28/3	45/3	54/3
£1	„ „ 5% Pref. ..	17/9	16/-	16/10½	17/-
£100	„ 4½% Unsec. Loan	£88½	£80	£86	£86½
£100	„ 5½% Conv. Loan	£173	£99	£142½	£173
1/-	Kleemann (O. & M.) Ord.	7/3	2/6	5/7½	7/-
£1	„ „ 6½% Pref.	17/-	15/-	16/7½	17/-
2/-	Lacrinoid Prod. Ord. ..	2/5¼	1/5¾	2/3	2/3
5/-	Laporte Ind. Ord. ..	27/6	13/7½	22/1½	26/-
£1	„ „ 7½% Pref.	23/6	21/10½	22/6	23/3
£1	Leyland & Birm. Rubber Ord.	58/9	39/9	48/-	52/6
£1	„ „ 6% Pref.	21/3	16/1½	17/-	16/10½
2/-	London Rubber ..	11/6	6/3	10/6	11/6
£1	„ 6% Red. Cum. Pref.	19/9	16/3	18/9	18/9
£1	McKechnie Bros. Ord.	47/6	23/6	46/-	47/6
£1	„ „ 'A' Ord.	46/3	30/-	43/-	46/3
£1	„ „ 6% Cum. Pref.	17/-	16/-	16/9	17/-
5/-	Monsanto Chem. Ord. ..	21/-	13/-	19/-	21/-
£1	„ „ 3¾% Pref.	13/-	11/-	13/-	13/-
£100	„ 6% Debs.	£104	£101¼	£103¼	£103
£1	North British Rubber ..	—	—	16/-	16/6
5/-	Redfern Holdings Ord...	5/2½	2/10½	4/6¾	5/-
2/-	RFD Ltd. Ord.	6/6	3/5¼	5/2½	6/-
£1	„ „ 5½% Pref. ..	15/-	11/6	14/1½	14/10½
2/-	Rubber Imp. Ord. ..	15/6	4/9	6/-	6/-
2/-	„ „ 'A' Ord.	14/3	4/6	5/-	5/-
£1	„ 5% 1st Pref.	12/3	10/-	10/-	10/-
5/-	Rubber Reg. Ord. ..	13/6	10/6	12/6	13/6
4/-	Shaw Francis Ord. ..	19/-	9/9	16/3*	18/9
2/-	Silentbloc Ord. ..	9/9	7/6	8/3§	9/9
2/-	Sussex Rubber Ord. ..	1/11¼	7¾	1/11½	1/7½
5/-	Sutcliffe Speak Ord. ..	9/9	5/-	8/3	9/6
£1	Turner & Newall Ord. ..	93/-	52/-	80/9	92/6
£1	„ „ 7% Pref.	25/-	22/1½	24/-	23/9
5/-	Universal Asbestos Ord.	26/10½	8/0¾	22/6*	26/3
5/-	Viscose Dev. Ord. ..	13/9	6/3	11/6	11/3
5/-	Warne William (Holdgs.) Ord.)	14/6	8/-	13/10½	14/3

*Ex-dividend †Ex-all ‡Ex-bonus §Ex-rights

TO LESSEN YOUR MOULDING PROBLEMS

SEPARAID

THE CHEAPEST MOULD RELEASE AGENT AVAILABLE AT HIGH PERFORMANCE LEVEL. WHITE COLOURED CONCENTRATE TO BE DILUTED AS LOW AS 2%. IT IS STABLE AND SAFE TO HANDLE. NO DISCOLORATION. ALSO SUPPLIED WITH SILICONE ADDITIVE

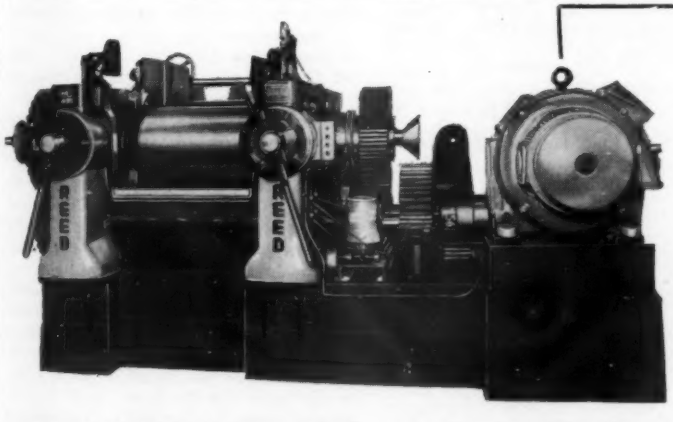
ARDROX

THESE WELL KNOWN FLUIDS COVER
- **Mould Cleaning Hot or Cold**
- **Rust Removal**
- **Film Protection in Store**
- **Degreasing or defilming**

ABSOLUTELY NO EFFECT ON METALS NORMALLY EMPLOYED. DATA IS AVAILABLE ON EQUIPMENT OR PLANT.

WITCO CHEMICAL CO., LTD.

Head Office: **BUSH HOUSE, ALDWYCH, LONDON, W.C.2**
Telephone: TEMple Bar 6473/6476
PEARL HOUSE, PRINCESS ST., MANCHESTER 2 (Central 9066/8) 62 ROBERTSON ST., GLASGOW C.2 (City 3495)
Works at: **UNION LANE, DROITWICH SPA, WORCESTERSHIRE**
Also at · NEW YORK · CHICAGO DETROIT AKRON · BOSTON · CLEVELAND



REED FOR REFINING MILLS

Reed 30″ × 24″ and 19″ Heavy Duty Double Geared Refining Mill fitted water cooled bearings with self-contained 75 H.P. Drive; machine cut gears throughout; roller bearing plummer blocks; individually hinged cheeks; the unit mounted on steel bedplate fitted anti-vibration mountings, as illustrated, showing machine cut gears, but supplied with sheet metal guards.

Also available in other sizes.

Large stock of reconditioned secondhand Rubber Mills, Calenders, Presses etc.

REED BROTHERS (ENGINEERING) LIMITED

Replant Works,
Woolwich Industrial Estate, London, S.E.18
Phone: Woolwich 7611/6 *Grams:* Replant, London, S.E.18

Rubber Markets

LONDON

The event of the week in the rubber market has been the publication of the Board of Trade's plans for disposing of its stockpile. Prices of Spot and nearby positions slumped sharply on Monday after these plans were published but there has since been some recovery. Spot dipped to 32¾d. immediately after the news but rallied later to 33¼d. to show a net fall on the week of 2⅝d. The market for nearby supplies remained uncertain, however. The more distant positions were virtually unaffected by publication of the Board's plans and prices have been fully maintained.

Latest prices are as follows:

No. 1 RSS Spot: 33d.-33¼d.

Settlement House:

November 31¼d. buyers.
December 29⅞d. nominal.
January/March 29⅝d.-29⅞d.
April/June 28⅞d.-29⅛d.
July/September 28⅝d.-28⅞d.
October/December 28⅛d.-28⅜d.

No. 1 RSS cif basis ports:

November 29⅞d.-30d.
December 29⅝d.-29⅝d.

Godown:

Nov, 101⅞ Straits cents nominal.

LATEX

Centrifuged latex per gallon in drums, January shipments, 19s. 1d. seller, cif European ports. Spot, 21s. nominal. Bulk, 19s. nominal. December delivery, nominal. Creamed, seller, 18s. 9d. December. Normal, seller, 14s. 11d. December.

AMSTERDAM

The Amsterdam rubber market ruled as follows on October 19:

No. 1 RMA	Guilders per kilo Oct. 19	Previous
October	3.18	3.18
November	3.13	3.13
December	3.04	3.04
October/December ..	3.05½	3.09
January	2.81	2.81
February	2.81	2.81

Sales: Nil Tendency: quiet

SINGAPORE

Rubber prices moved lower on October 19 following the weekend announcement of the British Board of Trade stockpile selling programme. Top grade sheet for November shipment opened at 99⅞ Malayan cents per lb. buyer, 1⅜ cents below Friday's close. Brokers said that the market was ruling quiet at the lower level. The majority of dealers was awaiting the London reaction to the Board of Trade announcement. Top grade sheet for November shipment closed the morning session at 100¾ cents per lb. buyer. Although the market was idle for most of the afternoon some enquiry towards the close for November RSS No. 1 improved prices slightly. Sellers continued to be reserved and lower sheet remained ignored. The market finished on a quiet note.

	Straits cents per lb., fob Malayan ports to open ports	
	Closing	Previous Close
No. 1 RSS, Nov.	100⅜–100⅝	101¼–101½
Dec.	98½– 98¾	98¾– 99
No. 2 RSS, Nov.	100 –100½	100¾–101¼
No. 3 RSS, Nov.	99½– 99¾	100 –100¾
No. 4 RSS, Nov.	98¼– 99½	99¼–100¼
No. 5 RSS, Nov.	97 – 97½	98 – 99
No. 1 RSS, Spot	104¼–104½	105¾–106¼
No. 3 blanket, thick, remilled Nov. ..	99½–100½	99½–101½
No. 1 fine pale crepe, Nov. ..	113½–115½	113½–115½
Thin brown crepe, Nov. ..	98¼– 99¼	99 –100

Tendency: quiet

The Industries Syndicate quote latex, native produce, 60% centrifugal, packed in rec. drums fob at 200.20d. per gallon.

BANGKOK

No. 1 RSS

The price for No. 1 RSS, at Bangkok on October 19, was 32.37½ (32.87½) US cents per lb.

NEW YORK

The New York rubber market ruled as follows on October 19:

DEALERS' PRICES

	US cents per lb. Today	Previous
No. 1 RSS, Oct. ..	39½n	40a
Nov. ..	37½n	37½a
No. 2 RSS, Oct. ..	39½n	39½a
Nov. ..	37n	37a
No. 3 RSS, Oct. ..	39n	39½a
Nov. ..	36½n	36½a
No. 1 RSS, Spot ..	40n	40½n
No. 3 amber blanket crepe, Dec. ..	35½a	35½a
No. 1 latex, thin crepe, Oct.	39½n	39½n
No. 1 latex, thick crepe Oct.	40½n	40½n

FUTURES—REX CONTRACT

	US cents per lb. Close	Previous Close
Nov. ..	36.80b–36.90a	37.10t
Jan. ..	34.40b–34.60a	34.70b–34.85a
March ..	33.80t	33.97t
May ..	33.15b–33.30a	33.25b–33.40a
July ..	32.90b–33.10a	33.00b–33.20a
Sept. ..	32.65b–32.85a	32.75b–32.95a
Nov. ..	32.40b–32.60a	32.50b–32.70a

Sales: 20 Tendency: steady

Rubber futures were very quiet on October 19 and prices steadied after early easiness. During morning dealings, futures dipped. The easiness reflected lower prices in London and Singapore. Later, however, losses were partially erased. Traders were somewhat confused as to the real impact on the market of stockpile sales of rubber by the United States and Great Britain and were waiting for further developments. Physical rubber was extremely quiet.

DJAKARTA

The Djakarta rubber market closed as follows on October 19:

	Rupiahs per kilo Oct. 19	Previous
Spot No. 1 Priok ..	31.30b	31.50b
Spot No. 2 Priok ..	30.30b	30.50b
Spot No. 3 Priok ..	29.30b	29.50b
No. 1 fine pale crepe, spot	29.00b	29.25a

Tendency: quiet

CEYLON

No. 1 RSS

The price for No. 1 RSS Spot, at Colombo on October 19 was 119 Ceylon cents per lb.

STOCK MARKET

Continued from page 498

improvement in trading which was recorded at the last AGM has continued for the first half of the current year.

The rapid advance of the ordinary units of the JOHN DALE group is accounted for by a take-over tussle which has now developed for control of the group.

An unchanged interim of 5% from P. B. Cow did not measure fully up to expectations so the shares were a quieter market than most. Group turnover, it is stated, has shown a satisfactory increase but there has been a slight reduction in profits due to rising costs. The company is in the process of closing its Welsh factory and production will be switched to another factory nearer London.

DUNLOP RUBBER ordinary which have recently been held in check on fears of extreme competition among the tyre manufacturers, advanced vigorously. The ordinary shares shot up to 28s., a new peak for the year. The interim report from the company disclosed an increase of £7 million to £127 million in sales and a rise of around £810,000 to £3,150,000 in the profit before taxation. The level of demand for the company's products in the current year so far continues to be generally favourable, but, the directors warn, the full effect of the rise in the price of natural rubber is now being felt. The interim dividend is held at 3½%.

ANGLO - AMERICAN VULCANIZED FIBRE ordinary remained unchanged following the news of a maintained final dividend of 10% which again brought the year's total up to 15%.

The trading profit came out at £86,700 against £93,200 for the previous twelve months.

Industry INTELLIGENCE

Technical Data

'Ankolors' for Rubber

Bright, fast colours greatly enhance the sales appeal of a variety of rubber products, as for example, flooring, mats, play balls, bathing caps, ladies' waterproofs, beach and other toys, etc. A range of 'Ankolors,' specially suitable for colouring rubber products of this kind, has been developed as a result of close collaboration between the Rubber Service Laboratory of the Anchor Chemical Co. Ltd. and the Colour Laboratory of the Cornbrook Chemical Co. Ltd. The range comprises five shades of red (scarlet Y, red Y, rubine, crimson, claret), five shades of blue (azure, blue T, blue 7566, royal blue, blue Y), emerald green and a darker green, violet, yellow, orange and brown. An attractive brochure giving technical data on these 16 'Ankolors' and containing colour patterns has recently been issued by the Anchor Chemical Co. Ltd., Clayton, Manchester 11.

All 'Ankolors' are stable to press vulcanization and do not change in shade in steam cures. The test mix used contained 2.8 parts of the 'Ankolor' and was based on pale crepe 100 parts, lithopone 30 parts and the accelerators 'Ancatex' and 'Ancazide Mc.' For sponge rubber tests, the mix was the same with the addition of 10 phr of ammonium carbonate; rubine, scarlet Y, crimson, blue T and violet change shade slightly in the sponge mix, the other colours being unaffected. Washing the rubber sponges in boiling soapy water may remove traces of colour from those containing rubine, crimson, royal blue, blue Y, violet and claret. For testing resistance to cold-curing with sulphur chloride, a proofing compound of the following composition was used: pale crepe 100, No. 822 white factice 50, barytes 85, lithopone 12.5, light calcined magnesia 2.5 and 'Ankolor' 1.25. The compound was cured for 15 seconds in 3% sulphur chloride in carbon bisulphide; azure, blue T and royal blue are changed in shade by the sulphur chloride, the other colours being unaffected.

In steam cures, royal blue, violet and claret tend to mark fabric and chalk; the other colours are non-bleeding. As 'Ankolors' are insoluble in rubber, they do not bloom or migrate to adjacent stocks of another colour, with the exception of yellow T which migrates very slightly but much less than alternative yellows of equivalent strength. In sunlight and ultra-violet light, royal blue darkens and violet fades, but all other 'Ankolors' are very resistant to light. Pastel shades may, however, show some slight change in colour on exposure because of the effect of light on the rubber itself. None of the colours are adversely affected by heat ageing. The results are summarized in a table showing the resistance of each colour to the different methods of cure and to the various factors mentioned above. Eight 'Ankolors' (two reds, two blues, the darker green, yellow, orange and brown) are suitable for use in latex.

Machines, Materials and Equipment

Pantograph Machine

Taylor, Taylor and Hobson (a division of Rank Precision Industries Ltd.) have produced a new bench-type pantograph machine designed to appeal to those users who have insufficient space for the larger type of pantograph machine now in production. This new machine meets the requirements of such users as shipboard workshops, mobile military workshops, jewellers, funeral furnishers and many other light engineering applications. This latest product of the historic firm which originated pantograph machines, although priced

at £150, is capable of working to the high quality and accuracy of the other machine tools manufactured by Taylor-Hobson. Its pantograph gives a wide range of reduction ratios from 1:1 to 16:1. This is unique in any bench-type machine. A simple cutter grinder attachment is also available.

Materials Transporter

Introduced by Tool Treatments (Chemicals) Ltd., of Colliery Road, Birmingham Road, West Bromwich, the new 'Mini-Bogie' provides an efficient method of man-handling a wide range of commodities within factories. The large high density polythene container, size 18in. x 15in. x 13¼in., mounted on a transporter, is robust and suitable for moving small engineering component parts, and for use as a carrier for chemicals and corrosive materials or other products that can be easily contaminated. The transporter has an

all-welded steel frame revolving freely on the centre wheels. The price of the 'Mini-Bogie' is £4 18s. 6d., and of the HN.826 polythene container 75s.

Publications Received

Cold Curing Silicone Rubbers

Midland Silicones Ltd. have published a technical booklet describing the cold curing silicone rubbers—'Cold-Cure Silastomer.' These rubbers, which are made in three grades, have been developed at the Midland Silicones plant at Barry, Glamorgan, and were recently put on a regular production basis. The great advantage of these products is that they need no heat cure: the addition of a small quantity of catalyst converts them at room temperature into heat-stable rubbery products. No special equipment or skill is needed. The booklet describes in detail the properties of these rubbers, explains how they are processed, lists established uses and suggests many more. The publication is well illustrated and has several tables on which the properties of these products are clearly set out. Midland Silicones Ltd. supplies these products in three grades: Silastomer 9159, the heavy grade which can be moulded, milled or calendered; 9160, the medium grade suitable for spreading and caulking techniques, and making flexible moulds; and the fluid grade, 9161, which can be used for dipping, injecting or impregnating. The booklet is available from the company at 68 Knightsbridge, London, S.W.1.

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

LANCEFOAM (788,920) For foamed rubber, foamed synthetic rubber and foamed plastics, all for use as fillings for pillows, bolsters, mattresses and for upholstery. By Lancefield Aircraft Components Ltd., 73 Herries Street, London, W.10. To be associated with No. 730,503 (4007,291). (Class 17; September 9 1959.)

LUXITUFT (787,884) For tufted rubber backed carpeting. By Royland Claude Metcalfe and Joan Butler trading as The Carpet Shop, The Carpet Shop, 510 London Road, Sheffield, 2. (Class 27; September 9 1959.)

SOAB

(778,960) For fatty acids derived from vegetable or animal oils; salts and esters, all being chemical products derived from such acids and being for industrial use; binding materials for core sand for foundries; aliphatic and aromatic dicarboxylic acids for industrial use; anhydrides, esters, amides and salts, all being chemical products derived from such dicarboxylic acids and being for industrial use; naphthaline; naphthaline derivatives, being chemical products and chemical compounds of naphthaline, all for use in manufactures; oils included in Class 1 and chemical products, all for use in the manufacture of fibres, textile products, cordage and nets and for treating wood in the course of manufacture; plasticizers, being chemical products used in the manufacture of resins, dyes and pigments; preservatives for foodstuffs for human and animal consumption; catalysts; driers, stabilizers, inhibitors, accelerators and anti-oxidants, all being chemical products used in the manufacture of paints, lacquers, synthetic resins and of rubber; size and adhesives, all for use in industry; and synthetic resins for use in manufactures. By Svenska Oljeslageriaktiebolaget, Kvarnbygatan 6, Gothenburg-Mölndal, Sweden. Address for service is c/o Stevens, Langner, Parry and Rollinson, 5 to 9 Quality Court, Chancery Lane, London, W.C.2. To be associated with No. 778,961 (4229, 827). (Class 1; September 16 1959.)

Mr T. F. C. Frost has been appointed an additional director of the Bukit Sembawang Rubber Company.

COMPANIES in the NEWS

P. B. Cow

In maintaining the interim ordinary dividend at 5%, P. B. Cow Ltd. state that while turnover has shown a satisfactory increase there has been a slight reduction in profits due to rising costs and a continuing loss incurred by the subsidiary making inflatable life-saving equipment. In order to effect the necessary economies, and coinciding with other factory organization plans within the group, the factory in South Wales is being closed down and production transferred to another factory nearer London.

Silentbloc Ltd.

The group trading profit of Silentbloc Ltd. increased from £405,583 to £419,009 in the year to May 31 1959. Net profit after tax was £149,799. A final dividend of 3d. per share is recommended and makes a total distribution of 6d. per share for the year. In his annual report the chairman, B. H. Dulanty, states that in the year under review, greatly increased competition reduced profit margins in the old established products of the group. The satisfactory result of the year's trading was largely due to products which had been introduced during recent years. The group's manufacturing facilities were to be expanded with additions to the office block and factories at Crawley, Sussex. Order books were at a higher level than at the same time last year and the board looked forward to the future with some confidence.

Dunlop Rubber Co. Ltd.

The net profit of the Dunlop Group after taxation for the first six months of the year amounted to £3,150,000 as compared with £2,640,000 for the corresponding period last year. The net trading balance was £10,520,000 as against £9,630,000, and the net profit attributable to the parent company £2,630,000 (£2,030,000). The Board states that the level of demand so far for the second half of the year, in most of the territories where the Group operates, continues to be generally favourable, but the full effect is now being experienced of the higher price of natural rubber which is being only partly offset by an increased proportion of synthetic rubber. Price competition in many markets has also been intensified. However, providing trading conditions between now and the end of the year remain as at present, it is anticipated that the level of profit for the first six months of the year will be maintained in the July/December period. The Board has decided that the interim ordinary dividend for the current year should be 4d. per 10s. stock unit, less income tax, which after taking account of the recent bonus issue is equivalent to the interim ordinary dividend rate of 5d. paid in the year 1958.

NEW COMPANIES

K Plastics Ltd. (633,211).—July. Capital: £100 in £1 shares. The first directors are to be appointed by the subscribers. Regd. office: 23 [illegible] Street, London, E.C.2.

Gemodels Ltd. (633,324).—July 23. Capital: £200 in £1 shares. To acquire the business of a modeller and plastic model manufacturer carried on by George Musgrave at Croydon, as. The directors are: George Musgrave, 2 The Waldrons, Croydon, Surrey, and George T. Culpitt, 13 Hamilton Road, St. Albans. Regd. office: 2 The Waldrons, Croydon.

Special Purpose Machines (Engineers) Ltd. (633,518).—July 24. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in plastic machinery, die castings, machine packaging, etc. The first directors are not named. Solicitors: Clifford-Turner and Co., 11 Old Jewry, E.C.2.

Excel Upholstery Co. Ltd. (630,743).—June 19. Capital: £1,000 in £1 shares. To carry on the business of upholsterers and workers in tapestry, leather, artificial leather, plastic and synthetic materials, etc. Regd. office: Bank Chambers, 180 Bethnal Green Road, London, E.2.

Tyres, Bournemouth (1959) Ltd. (633,536).—July 24. Capital: £100 in £1 shares. The directors are: Edward G. Dutfield, 'Southwinds,' Holly Hill Lane, Sarisbury Green, Hants., and Henry T. Dutfield, 'Dunsleycombe,' Selsey, Sussex; both directors of Rubber Components Ltd., etc. Regd. office: 7 Brunswick Place, Southampton.

Wide Awake Tyre Services Ltd. (633,607).—July 27. Capital: £100 in £1 shares.

A.V.P. Properties Ltd. (634,085).—July 31. Capital: £50,000 in 1s. shares. The directors are: Harold H. Poster, 55 Portland Place, London, W.1; Ralph Freeman, 'Helmsdale,' Green Lane, Stanmore; and Roger L. Harper; all directors of A.V.P. Industries (Sales) Ltd., etc. Regd. office: 20 Angel Factory Colony, London, N.18.

Tyre Services (Ash Vale) Ltd. (629,087).—May 28. Capital: £1,000 in £1 shares. To carry on the business of manufacturers and repairers of and dealers in tyres of all kinds, etc. The directors are: Norman C. Morgan and Mrs Elsie J. Morgan, both of 'Thornham,' Chingford Avenue, Farnborough, Hants. Regd. office: Lysons Avenue, Ash Vale, Surrey.

Negri Bossi (England) Ltd. (628,465).—May 20. Capital £500 in 250 'A' ordinary and 250 'B' ordinary shares of £1 each. To carry on the business of machine and engineering tool makers, and manufacturers, plastic extrusion, mechanical, hydraulic, electrical, pneumatic and general engineers, etc. Regd. office: 8 Landport Terrace, Portsmouth.